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CULTURE AREAS IN MADAGASCAR

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PRACTICALLY all the authors who have written on Madagascar have assumed a priori that the native culture is uniform throughout the island. One constantly meets with statements that "the Malagasy" believe or do such and such a thing when actually only a single tribe or even gens has this practice or belief. This error is probably due to the great size of the island and the fact that very few Europeans are familiar with it as a whole. I have myself been guilty of stating that the culture was surprisingly uniform, being deceived by the fact that my first year's work was carried on almost entirely within a single culture area. I can only offer in extenuation that the article in question ("Report on Work of Field Museum Expedition to Madagascar," AMERICAN ANTHROPOLOGIST, n.s., 29: 292 sq.) was not written with a view to publication. The information in this paper was collected by the Captain Marshall Field Madagascar Expedition; published by courtesy of Field Museum of Natural History.

There appear to be three fairly well marked culture areas in Madagascar, with the usual marginal tribes of mixed culture. (See fig. 1.) These areas, which agree in a general way with the main geographic and climatic divisions of the island, are as follows:

1. The East Coast, with a partial subdivision into a northern part, occupied by the Betsimisaraka tribe, and a southern part occupied by a number of small tribes commonly, but incorrectly, grouped under the term Antaimorona.

2. The Plateau, occupied by the Betsileo, Imerina (commonly called Hova) and Sihanaka.

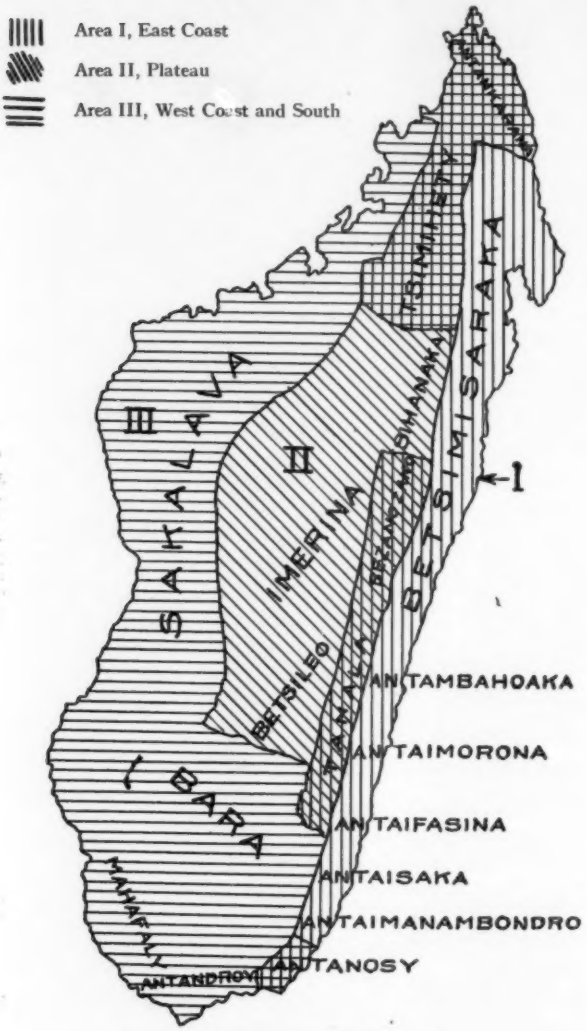

Fig. 1. Culture areas, Madagascar.

3. The West Coast and Extreme South, occupied by the Sakalava, Mahafaly, Antandroy, and Bara.

The Tanala and Bezanozano tribes are intermediate in culture between areas 1 and 2, while the Tsimahety and Antankarana in the extreme north and the Tanosy in the southeast seem to be intermediate between areas 1 and 3.

AREA 1. THE EAST COAST

Geography, Climate, etc.

This area extends nearly the whole length of the island, about 1000 miles, and is bounded on the west by the divide separating the eastern slope of the mountains from the interior basin. In the north the hills come down almost to the sea and the coast is rocky and broken, with one natural harbor at Antongil bay. As one goes southward the strip of level land along the coast becomes wider and the shore is a continuous sand beach. There are many rivers, but their mouths are invariably blocked by bad bars and the surf is high during most of the year. In many places there are lagoons and swamps behind the beach. Except in the extreme north, the soil of the coastal strip is uniformly poor and sandy. In the north heavy tropical jungle comes down to the sea's edge, but the growth decreases in density as one goes southward. There is everywhere a sufficiency of good timber. The climate is hot and humid, and rains come at all seasons but are heaviest in the north. Fever is prevalent throughout the area and takes a heavy toll of plateau natives and whites.

Material Culture

Villages.—All the inhabitants live in villages, isolated dwellings being unknown. These were formerly protected by stockades of pointed logs, without ditches. The houses within the village are arranged in groups occupied by close relatives, as a man and his married sons.

Houses.—Houses are rectangular, and of fairly large size, with rather heavy wooden frames and walls of midribs of the traveler's tree or of flattened bamboos woven in checkerwork. All houses are raised on posts, 1 to 5 feet high, and floored with

flattened bamboos or split trunks of the traveler's tree. There are no beds or other furniture.

Granaries.—Granaries are built beside the dwelling. They are small gable-roofed houses raised on high wooden posts having a collar at the top to keep out the rats.

Clothing.—Men's costume consists of a smock-like garment, sleeveless and reaching to slightly above the knee. In the south of the area this is said to have originally been a poncho, open at the sides. It is often carefully fitted and may have a pocket. The loin cloth is not worn. Women wear a straight, tubular garment reaching from armpit to knee. This is held in place by a broad belt with a matting pocket in the middle of the back. The top is folded down over the belt when working. A brassier, or short, tight sleeveless jacket, is now worn but may be an innovation. Both sexes wear close-fitting, brimless caps of matting. Garments are made of raffia cloth in the north and of fine pliable matting in the south. Bark cloth was formerly used for the women's belts and occasionally for other garments. All married women employ the *baby cover*, a small mat which is hung over the back by a cord about the woman's neck and covers the infant when carried on the back.

Exposure.—Exposure is common and the natives pay little attention to it, in sharp contrast to those of the other two areas. Men often remove the smock when working in water, and children of both sexes may go nude to eight or nine years.

Ornaments.—They are little worn and are limited to rings, earrings, bracelets, and necklaces. The last two practically always have a charm value if worn by men. The ears of both sexes are pierced, but the lobe is not enlarged.

Hairdressing.—This is simple. Men's hair is usually cut short, women's done in a number of braids fastened close to the head.

Tattooing.—This occurs in both sexes, but is scanty and without significance.

Spinning and weaving.—With one exception, spinning and weaving are done by women everywhere in Madagascar. Among the Antaisaka in the southern part of the area men both spin and weave. Elsewhere in the south the spindle is employed by men

for twisting fish lines, but there is no weaving. The Betsimisaraka weave fine raffia cloth of untwisted fiber, but are unable to spin. Their looms are horizontal, without belts, and are raised 2 or 3 feet above the ground. A treadle attachment has been introduced in recent times. The only designs are plain stripes.

Bark-cloth.—It is made by all tribes, but the pieces are usually small and of inferior quality. It is now used only for women's belts but complete garments were once made from it in the south. The bark is beaten with a round transversely grooved club without removing it from the sapling. When half finished it is pulled off like a sleeve, and left for a time in a damp place, then beaten again.

Mats.—Mats are used as clothing by all the southern tribes. They are woven from a tough sedge and kneaded under water to render them flexible. Sleeping mats, food mats, floor mats, etc., are woven from a variety of materials, but the work is usually coarse with little decoration.

Baskets.—Baskets are made by the mat technique, coiled basketry being unknown. Only a few forms are used and the work is coarse with little decoration.

Pottery.—This was almost lacking in the area, food being boiled in green bamboos. This may be due to a lack of suitable clay as it was known and imported from the interior tribes. Iron pots are now in universal use.

Utensils.—In the north food is served on mats or in leaf dishes and eaten with leaf spoons, the service being renewed for each meal. In the south wooden bowls and spoons are used. Some of the bowls are well made and are decorated with a hot iron point applied on the compass principle. Gourds are rare and highly prized and are cleverly imitated in wood.

Agriculture.—Agriculture is universal in Madagascar. The northern staple is maize, which is cracked in deep narrow mortars and boiled. Rice of both the wet and hill varieties is also grown in this region with a little taro and sweet potatoes. In the south the staple food is rice of the wet variety. In both places the rice is planted in naturally swampy ground and there are no extensive terrace systems. No manure is used and the cultivation is primitive. There are no seed beds. The rice is headed and stored in

the granaries unthreshed, a little being beaten out as needed. There are no threshing floors. Rice is hulled in large wooden mortars with a heavy pestle, and boiled.

Domestic animals.—The ancient domestic animals were cattle, chickens, and perhaps ducks and geese. Goats, pigs, and dogs were known, but were taboo to most of the tribes. Sheep appear to be recent. Cattle are nowhere numerous and are economically unimportant. At night they are driven into fenced pens, which are often roofed. Milk is a rare luxury and is drunk fresh or boiled with rice. Cattle are considered a sign of wealth and considerable prestige attaches to the ownership of a large herd. Only cattle and chickens are sacrificed and the animals are rarely killed for any other purpose.

Hunting.—Hunting is unimportant, although some tribes catch or shoot the lemurs and wild pigs. The latter are taboo to several gentes.

Fishing.—This is important and is carried on both in the rivers and at sea. Fish spears are single-pointed with a barb. Iron hooks and bone gorges are employed, the latter only with set lines. There are dip nets and seines and a variety of fish traps. One species of fish is lured within spearing distance with cleverly made wooden decoys.

Canoes.—The outrigger is unknown. River canoes are simple dugouts. Sea-going canoes are dugouts in the north, plank canoes sewn with fiber in the south. Sails appear to be a recent innovation. Northern paddles have short, almost circular blades, southern ones long narrow blades. Both have cross grips.

Metal-working.—This is poorly developed. The Malay type of piston bellows is used everywhere in Madagascar. There is no smelting, and the local tools, etc., are roughly made. Casting and inlaying are unknown and there is no ornamental ironwork. A few silver bracelets are made locally, being incised with simple designs.

Weapons.—The principal tool and weapon is the axe, which has a cleaver-like blade attached to the handle by a horizontal tang. The eyed axe was unknown. Next in order of importance are spears, long, single-bladed swords, straight or slightly curved,

short knives, and round shields of wood covered with hide. The sling is little used and the bow is a toy. The blowgun with poisoned darts is used in the north, elsewhere there is no poison and it is used only for small birds. The poison does not injure the game as food.

Social Organization

In the northern part of the area the social organization has broken down under long European contact and vassalage to the Imerina empire. It seems to have originally been much like that which continued in force in the south until the French conquest. There the basis of both social and political organization was the gens, a group of persons who claimed descent from a single ancestor in the male line. Each gens occupied a definite territory and had its own chief and Lahy Kibory (guardian of the gens tomb). New gentes arose by natural fission when the group grew too large for its territory or was split by internal disputes. The chieftainship was vested in the family which had the most direct descent from the common ancestor, tracing through eldest sons. The office of Lahy Kibory, which was of almost equal importance, might be vested in this family and held by a younger brother of the chief, but was usually vested in the family of next highest descent. The tribe was a rather loose agglomeration of gentes which occupied contiguous territory and had been brought together by conquest or voluntary submission. The latter was quite common in the case of weak gentes. Apparently gentes sometimes seceded from one tribe and joined another. Within the tribe the gentes are organized in three grades: a royal gens, which stood at the head, one or more noble gentes with special privileges, such as the exclusive right to kill cattle, and the common gentes which formed the bulk of the population. The hereditary chief of the royal gens was the tribal king, and families from this gens often imposed themselves as chiefs on the minor gentes. Both royal and noble gentes occupied definite areas within which their members performed all the usual functions, cultivating their own land, etc. No gens paid tribute to another, so the economic value of royal or noble birth was slight. Royal

gentes acquired their rank by fighting ability and acted as a sort of police force, preventing fighting among the inferior gentes and protecting them from outsiders. If they became weak or ruled oppressively, some other gens would oust them from the leadership, but they would retain certain privileges and be classed as nobles.

Kings.—The king was the social and political head of the tribe. As a prince he was expected to distinguish himself in battle, but when king he rarely acted as war leader. His main functions seem to have been judicial, and he acted as a supreme court to which one might appeal from the judgment of the gens chiefs. In most tribes he held the exclusive right to condemn to death. His judgment was final, and evasion or even criticism was punished by a fine for contempt. His revenue was derived from fines paid by criminals, including all persons who violated any of the long series of taboos connected with the royal person and property. Evil kings often executed rich commoners on false charges, to get their property. No regular taxes were paid for the king's support, but he could call on the commoners for necessary labor.

Nobles.—The nobles seem to have taken little or no part in the government, possibly because of royal jealousy.

Mpifasana.—The Mpifasana were commoners who lived in the royal villages and served the king as courtiers, messengers, etc. They were usually drawn from a single common gens and possessed great power in the government. They remained commoners, however, and the king could deprive them of their privileges at will.

Slaves.—Slaves stood at the bottom of the social order and consisted of prisoners of war, certain classes of criminals, and their descendants. First generation slaves were sold like any other chattels, but members of slave families came in time to be considered members of the gens, although without social standing. In at least some cases they owned property and differed little from poor freemen. All slaves were forbidden to bear arms.

Marriage.—Marriage is normally exogamous, although marriage within the gens may be compounded by a fine to the Lahy Kibory. The family is patrilocal. The marriage is arranged by

the young people themselves, the son notifying his father, who then makes formal application to the girl's father. A small sum is paid to the girl's parents, not as the price of the girl but as that of her potential children. If the girl later deserts or is divorced, the price is not returned, but all children belong to the father's gens. If it has not been paid the marriage is not legal and all children belong to the mother's gens. Marriages between the different castes were not prohibited, except in the case of slaves, but were discouraged. The child's rank followed the father's.

Polygamy.—Polygamy is common, chiefs and rich men having as many as six wives. The first wife is head of the family and her permission is necessary for subsequent marriages. Each wife has her own house and share of the family land, from which she supports herself and her children. The husband spends stated days with each wife, being fed by her and working on her land.

Polyandry.—This is unknown except in cases where two men in making blood brotherhood have agreed that even their wives shall be held in common.

Chastity.—Chastity before marriage is highly valued by the southern tribes and girls usually remain virgins until married. There are some exceptions, however, and the Betsimisaraka lay little stress on this. After marriage all tribes punish the wife's adultery with divorce.

Divorce.—This is at the will of the husband, but the wife may divorce him if he has relations with a woman other than a plural wife during the wife's pregnancy, or has relations with her during a stated period after the birth of a child. The period is usually six months for a boy or three for a girl. The wife never receives any of the husband's property.

Property and inheritance.—Waste land was held by the gens and used by all members for grazing, wood-cutting, etc. Cultivated land belonged to the family who had brought it under cultivation. It could be sold within the gens, but not to outsiders. In the family all property except the wife's clothing and personal property belong to the husband. At his death barren wives receive nothing, others unequal shares, the largest going to the first wife. These shares they, in turn, divide among their children. Daughters

rarely receive land or cattle, as both are too valuable to be allowed to pass out of the family.

Religion

Ancestor worship.—It is the basis of religion everywhere in Madagascar. The ancestral ghosts are believed to be ever present and to take an active part in the affairs of their descendants, aiding them and also sending illness or misfortune if displeased. One worships only one's own ancestors.

Zanahary.—This is a name given to a power above the ancestors, from whom they derive their powers. In this region Zanahary is poorly personified and the natives are not sure whether he is one or many. Some claim that every gens, person, and even animal has its own Zanahary. He is mentioned in all sacrifices to the ancestors, but is never sacrificed to alone, and no prayers are addressed directly to him except where there is Arab or Christian influence. He is the source of both good and evil. Dualism is lacking.

Non-human spirits.—They are believed to exist, but the ideas in regard to them are hazy and they are never prayed or sacrificed to.

Sacrifice.—Sacrifice is the essence of all religious practices. All prayers are accompanied by sacrifices or vows to sacrifice. Ordinary sacrifices are performed in the home by the head of the family. Important ones are made at posts erected for the purpose in the north or at the tomb in the south. Each gens has its hereditary sacrificial priest. In the north the office may be held by a woman, but if so she will usually delegate her powers to a man. Here the *ombiasy* (medicine man) often acts as director of ceremonies and may introduce changes in ritual, but never sacrifices himself. In the south the sacrifices are performed by the *Lahy Kibory*, the ombiasy taking no part.

Sacred places.—They are practically non-existent, except for the tombs.

Sacred rivers.—Every tribe in the area, except the Betsimisaraka, has a sacred river into which the umbilical cords of all children are thrown. Unless this has been done the person is not

a member of the tribe and is forbidden burial in his gens tomb. Tombs are usually built near this river, drought and flood sacrifices are performed at its mouth, and it is used in the crocodile ordeal, etc. If a gens moved to a new locality it took water from its sacred river and baptized the new river by the old name.

Ombiasy.—This is the name for medicine men, who are everywhere important. In the north they may be either men or women, and sometimes are under the control of ancestral spirits. In the south they are always men and are not under spirit control. There they derive their powers from having been instructed by some other ombiasy in the *Vintana* (calendar of lucky and unlucky days), Sikidy (divination by geomancy), and formulae for making charms. The highest class practice a form of astrology. They are not organized or graded except in popular esteem. There is everywhere a clear line between the ombiasy and sacrificial priest.

Sorcerers.—They are greatly feared and put to death when discovered. They are refused admission to the tomb and their bodies may even be burned. They are not organized.

Possession.—Possession, usually by the soul of an ancestor or dead chief, is common in the north. It now exists in the south, but is said to be an innovation of Sakalava origin. In the north there are regular practitioners who answer questions, give cures for illness, etc. These are usually women. Real ombiasy are never possessed.

Charms.—They are made for every possible phase of activity and are universally worn and used. They are compounded according to strict formulae. The source of the power they confer is vague in the native mind.

Disposal of the Dead

In the northern division the dead are placed in large wooden coffins and left in village cemeteries, which are hidden in the deep woods. Earth burial is rare except in the region of Mananjary. Among the southern tribes each gens has a single tomb, the Kibory, in which all members, even the chief, are placed. The form varies, but it is commonly a deep ditch running in a north and south direction with a division across the center. Men are

placed in the north half, women and children in the south. The ditch is surrounded by a stockade and a house is usually built over it. At a death all the old corpses are removed and the new dead put at the bottom. The Kibory is surrounded by a grove which can only be approached by the Lahy Kibory or those whom he appoints. Natural caves or houses without the ditch are also used.

Souls of the dead.—They reside at the tomb or cemetery, where they form a community exactly like one on earth. There is no belief in reincarnation, but there is an idea that the souls of certain gentes enter animals. This is rare and its extent could not be determined.

Lahy Kibory.—The Lahy Kibory is an hereditary official who has charge of everything pertaining to the Kibory. He also acts as sacrificial priest and as judge in offenses against custom, as incest, receiving the fines levied.

Menhirs.—Menhirs are raised by the southern tribes, but not by the Betsimisaraka. They are raised beside roads, etc., far from the tomb, and those of the same family are usually grouped together.

AREA 2. THE PLATEAU

Geography, Climate, etc.

This area includes the whole central portion of the island at an average elevation of about 3,000 feet. It is bounded on the east by higher mountains which cut off much of the rain. The country is rolling, with little level ground except in the bottoms of river valleys, and has been completely deforested. It was at one time at least partially forested, for large timber is still found buried in river bottoms. There are few navigable streams and only two lakes of any size. The soil is rich and the climate good, with seasonal rains. The summer is not excessively hot, and there are often frosts in winter. Malaria is now common, but was not present in early times.

Material Culture

Villages.—They were built on hilltops and were always elaborately fortified. The use of stockades was taboo to all except

chiefs. The defenses consisted of from one to nine enormous concentric ditches, straight-sided, and sometimes as much as 30 feet deep with a wall or, in the south, cactus hedge on the inside. The Imerina had a peculiar form of gate made from a round stone, like a millstone, which was rolled back and forth. With the establishment of the Imerina empire many towns were abandoned, the people now living in groups of two or three houses scattered over the countryside.

Houses.—They were formerly built of heavy vertical timbers mortised into cross-beams at top and bottom. They were rectangular with steep roofs, and those of chiefs had long projecting horns at the gables. The very poor made houses of rushes, which are still in use among the Sihanaka. Elsewhere most houses are now of sun-dried brick or rammed earth. Houses were often built on low stone-faced platforms, but never raised on posts. The aversion to this is so strong that among the Sihanaka, many of whose villages are inundated annually, a floating floor is built inside the house rising and falling with the water. Floors are normally of earth. The Imerina and Betsileo used large wooden beds, built as a part of the house, and stools of wood of matting like pillows.

Granaries.—Granaries are bottle-shaped pits, often as much as 10 feet across and 10 feet deep, excavated in the hard clay soil. In these the rice is stored after threshing. Where the soil is wet, conical mud granaries are built with a side opening near the top. The Sihanaka use no granaries, stacking their rice.

Clothing.—Clothing consisted of a loin cloth for men and a knee-length kilt for women. A brassier or sleeveless jacket for the latter seems to have been introduced in early times. Both sexes wore the lamba, a large oblong blanket or shawl made from two or more strips of cloth sewn together. Men wore close caps of basketry, hide or lemur skin; women went bare-headed. All clothing was of cloth. The baby cover was not used. European clothing is now universal.

Exposure.—This is avoided by both sexes, and only small infants go nude.

Ornaments.—Women wore few ornaments and men almost

none. Women's ears were pierced and one gens of the Imerina expanded the ear lobe.

Hairdressing.—Hairdressing was very elaborate for women, the hair being divided into a great number of braids, which were arranged in different ways. Men anciently wore the hair in a number of small knots or hanging braids.

Tattooing.—This was rare except among the south Betsileo, where women were often tattooed on arms and with a broad collar across the chest. This was done after marriage and was considered a mark of distinction.

Spinning and weaving.—They are universal and highly developed. The Betsileo did not use the spindle in ancient times, rolling the thread on the thigh. The loom is horizontal and very low. A form of belt loom with a wooden back rest was formerly used by the Betsileo, but all modern looms are fastened to pegs driven in the earth. A great variety of materials were employed, banana fiber, bast, hemp, cotton, wild silk, and raffia. The last was boiled with lye and twisted into thread. Among the Imerina a native species of silkworm was semi-domesticated. The Imerina do some figure weaving, and one gens formerly knew the warp-dyeing process. Elsewhere the designs were simple stripes.

Bark-cloth.—It was known but rarely used. A hammer-shaped mallet was used.

Mats.—They are used primarily as floor covering. Many of them are finely woven and decorated with a variety of designs. The Sihanaka weave the finest, and their designs are named, a trait lacking elsewhere in Madagascar.

Basketry.—Basketry is well developed. Most of it is of matting technique, but there is a limited use of coiled basketry, most pronounced among the Sihanaka, and twining is used for fish scoops, etc.

Pottery.—This is well developed and is made by coiling with very wide strips of clay or by modeling from a cylindrical lump. Glaze was unknown, but red and cream slips were employed, also graphite. The Betsileo made a little painted ware, but most decoration was incised or modeled. The vessels are well fired. The art is now disappearing.

Utensils.—They are mostly of pottery; but large bowls are made of wood, and spoons of wood, horn, or bone. Food mats are unknown. Gourds are used as bottles. Small double mortars, sometimes of fantastic shapes, are used for crushing salt and pimentoes. Except among the east Betsileo, wooden utensils were rarely decorated.

Agriculture.—The staple food is rice of the wet variety, which is raised in elaborate terrace systems, sometimes of great extent in the south. Fertilizers are used, and the soil is carefully prepared. Seed beds are made and the young plants transplanted by women. The rice is harvested with the straw and carried to threshing floors, flat clay-floored areas having a large bench-shaped stone in the center. It is beaten out against the stone, winnowed, and stored. The straw is used for thatching or fuel. Maize, manioc, millet, beans, squashes, ground-nuts, sweet potatoes, taro, and greens are raised but are incidental to the rice diet. In the south a variety of sedge for mat-making is cultivated.

Domestic animals.—The ancient species were cattle, sheep, goats, pigs, dogs, and possibly the native wild cat, also chickens, ducks, and geese. Only cattle and chickens were sacrificed. Cattle are numerous but economically unimportant. They are kept in semi-subterranean pens excavated in the hard soil. Milk is a luxury and is boiled at once, then drunk or used to cook rice. Animals are only killed as sacrifices or at funerals. They are important in the ceremonial life, certain rites being performed in the cattle pit, the umbilical cord sometimes being fed to a cow, etc. Formerly fighting bulls was the principal native sport.

Fishing.—This is unimportant except near the lakes. Appliances are the same as in area 1, except for the fish decoys, which are lacking.

Canoes.—Canoes are simple dugouts. Outriggers and sails are unknown. The Sihanaka employ a distinctive form of paddle with a wide, flat shaft.

Metal-working.—This is fairly well developed, the iron being smelted locally. Casting and inlaying are unknown, but most tools show a good finish and the Betsileo do fine ornamental ironwork, twisting the bars and bending them into graceful forms.

Weapons.—The axe was usually of cleaver type as in area 1, but the eyed axe was also used. Other arms were like those of area 1 except that the shield was larger and the sword rather than the spear was the principal weapon. The sling was important. Blowguns without poison and bows were used by children for hunting.

Markets

Markets were introduced by the Imerina empire, but are now characteristic of the area and important. They are arranged in a cycle, each town within a given area having its day. Most trade is carried on in them.

Social Organization

The organization seems originally to have been not unlike that of area 1, but later the kingship was strengthened and became a family rather than gens matter. The king was considered owner of the tribal land and gave estates to brothers and favorites who sublet it to tenants, establishing a sort of feudal system side by side with the old arrangement. The complex organization of the later Imerina empire was due to European influence and is omitted.

Kings.—The king was an absolute monarch with complete power over the lives and property of his subjects. Actually he exercised these rights with discretion, as there were always claimants for the throne. He was supported by a ground rent, usually in the form of an offering of first-fruits made by all cultivators, by various fees, and by a share of fines levied. He served as supreme court as in area 1, and took no part in war. He could demand forced labor from his subjects, and this was carried to extremes in Imerina.

Nobles.—They took little part in the governmental activities, nearly all offices being filled by commoners, who could be deposed at will. These officials, together with persons to whom estates had been given, formed a sort of new aristocracy outside the old system.

Slaves. They were divided into two classes, foreign slaves, who were treated as chattels, and slaves belonging to the owner's

tribe, who were known by a special name and had many rights and privileges. Established slave families of this sort might own property, have their own tombs, bear arms, and accompany their masters to war.

Marriage.—Marriage was endogamous among the Imerina and Sihanaka, exogamous among the true Betsileo. The Imerina in particular practised very close intermarriage to keep property in the family. Half-brother and sister by different mothers could marry, and the children of two brothers or brother and sister were expected to marry. Children of two sisters, or their descendants in the female line, were absolutely forbidden to marry. Although the family was patrilineal, in marriages between castes the child took the mother's rank. The Betsileo forbid marriage between persons having a common ancestor within four generations on either the male or female line of descent. If such an ancestor is discovered, the marriage will be dissolved even if of several years' standing, Formalities of marriage, significance of the bride price, etc., are much the same as in area 1.

Polygamy.—This was common, but the rights and duties of the various wives seem to have been less clearly defined than in area 1.

Polyandry.—This existed in the case of blood-brothers. A man who expected to be absent for some years might permit his wife to contract a second marriage, but this was dissolved on his return, and any children born belonged to him.

Chastity.—Chastity before marriage was little valued, and the moral standard was markedly lower than among the southern tribes of area 1.

Divorce.—This was at the will of the husband except for the reasons stated in area 1. A wife divorced without good cause had certain property rights, however, amounting in Imerina to one-third of the husband's wealth.

Property and inheritance.—All land was considered the property of the king, others holding under him. Even waste and grazing land was held in severalty, although usually by families rather than individuals. Royal permission, given for a small fee, was necessary for land transfer within the tribe and only the

king could sell it out of the tribe. Family property belonged to the husband, but he had no right over his wife's inherited property, which might be considerable. This passed directly to her children. Inheritance was variable, but in general barren widows received nothing, other widows sharing in proportion to the number of their children rather than their rank. Daughters usually received less than sons, but there was no fixed rule.

Religion

Ancestor worship.—This was the strongest element in the religion, but there were certain features peculiar to the area.

Andriamanitra.—This was the name given to a supreme being who stood above all other beings and from whom they derived their powers. He was also called Zanahary, the two terms being used to describe aspects of the same being. He was more clearly personified than in area 1 and was single, but it is improbable that he was prayed or sacrificed to alone.

The Vazimba cult.—The Vazimba cult was based on the belief that the present inhabitants of the plateau area were preceded by an earlier race whom they conquered and expelled. The souls of this race became a sort of genii loci associated with springs, caves, rocks, etc., and certain spots where the grass grew in a peculiar way, cairns, or artificial arrangements of stones were believed to be their tombs. Although the Vazimba were of human origin, they had lost their human attributes in the popular mind and never appeared as ghosts. They were very powerful and in general malevolent, but would also help their worshippers. Certain of the local ones had their priests who received offerings for them and derived certain powers from them, acting as both ombiasy and priest. Certain of the Imerina gentes claimed Vazimba descent, but the Vazimba cult was practised by all. Among the Betsileo the same beliefs were held, but less strongly, and there were no Vazimba priests. There, however, certain persons would promise before death that they would answer prayers. Cairns were erected in their honor, and they were prayed to by non-relatives as well as relatives.

Idols.—Idols were limited to Imerina and were a late develop-

ment, forming a national religion outside the scope of the original ancestor worship. There were twelve of these, all of foreign origin. Each had its house and its priest who received offerings, and each had certain specific powers or fields of activity. They seem to have been nothing more than very powerful charms.

Sacrifices.—They were performed by the head of the family or by the person who had made a vow, if directed to the ancestors or ordinary Vazimba, or by the proper priest if to the idols or important Vazimba. The Betsileo had gens priests and the Imerina probably had them at one time, but their duties were rather restricted and the post of less importance than in area 1. Ancestor sacrifices were performed in the home or at the tomb. The sacrifice post was not used except by the Sihanaka.

Sacred places.—Sacred places (in connection with Vazimba) were numerous, but the idea of sacred rivers was lacking.

Ombiasy.—They were important and might be either men or women. The Betsileo had two types: Ombiasy Ankazo, who were not under spirit control, owed their powers to instruction by other ombiasy, and were always men; and Ombiasy Andolo, who were chosen by some ghost, had received no regular instruction, and were usually women. The activities and practices of both classes were the same, but the Ombiasy Andolo were held in greater esteem. Both used the Vintana and sikidy, but astrology seems to have been lacking.

Sorcerers.—They are much feared. They are both men and women, and are organized into a secret society. There is believed to be a chief sorcerer in each district who assigns work to the subordinate ones and has a society fund from which fines and bribes are paid. Many sorcerers keep familiars in the form of snakes, owls, or wildcats. Among the Sihanaka they are said to perform a sort of Black Mass, a travesty of Christian rites. Among the Betsileo they are thought to be possessed or controlled by malevolent ghosts.

Possession.—Possession is always by ghosts and is fairly common. There are regular practitioners among the Imerina and Sihanaka. Among the Betsileo possession is considered as malady and the possessed do not give oracles.

Charms.—Charms compounded from various substances are said to be an innovation among the Imerina. They had an elaborate lore of charm beads, some sixty varieties with different attributes being distinguished. The Sihanaka use many compound charms and the Betsileo a few. They are usually made by the ombiasy, but certain individuals who are not ombiasy possess the formulae for and make charms of one or more types.

Disposal of the Dead

Simple earth burial is said to have been practised by the Imerina and Sihanaka in the earliest times. The former also placed the bodies of chiefs in canoes and sunk them in deep lakes or rivers. At present all the tribes place the dead in chamber tombs, often of very large size, which have a rectangular stone-faced platform above. These are always built in prominent places, beside roads, etc. The dead are wrapped in lambas and laid on shelves. From time to time the tombs are opened and the bodies brought out, sunned, and rewrapped in new lambas. Each family has its own tomb and a rich man will build a new one for himself and his descendants.

Souls of the dead go to Mt. Ambondrombe, a real locality, where they live as on earth. They are also thought to be near the tomb and often to visit the sacred corner of the dwelling. The Imerina and Betsileo also believed that the souls of kings went to the sky world, where they became divine. Among the Betsileo and Sihanaka it is believed that the souls of certain gentes pass into animals. The Betsileo think that persons of the royal and noble gentes carry in their bodies through life a small animal or larva, which escapes from the body after death and becomes a snake, if royal, or a crocodile, if noble. Royal bodies were subjected to a sort of mummification to insure its escape.

Menhirs are very important among the Imerina and Betsileo but almost lacking among the Sihanaka. They are primarily cenotaphs erected in memory of some person, but the Imerina also raised them to commemorate great events. They were usually raised in prominent places at a distance from the tomb. Among the Betsileo those of a certain family are usually grouped together.

Sacrifices are sometimes made at them. Among the Sihanaka they are replaced by Teza, tall posts of hard wood forked at the top, which are decorated with the skulls of sacrificed oxen.

Art

Art was better developed than in area 1 but less so than in area 3. The textiles showed a fine sense of color, and the few designs used here and in mat weaving were harmonious. The Sihanaka did good carving in the round, but never carved designs. The Imerina did little carving of any sort. The southeast Betsileo did little carving in the round, but carved their houses, etc., with a variety of designs in low relief. The rest of the tribe rarely carved.

AREA 3. WEST COAST AND EXTREME SOUTH

Geography, Climate, etc.

To the west and south of the central plateau the island gradually slopes away to sea level, forming a wide sandy plain in the extreme south. Elsewhere the country is broken, but not excessively mountainous. The extreme south is covered with a dense thorny scrub, but as one goes northward this changes to rather open country with clumps of small trees and brush. There are dense forests of low growth in many localities and quite large timber in the river valleys, but nothing approaching tropical jungle. There are a number of large rivers which are navigable for some distance by native canoes. The rainfall is seasonal but light and the climate excessively hot, especially in the south. The soil is, on the whole, poor, and only a few areas can be brought under cultivation, owing to insufficient water. There is a good deal of malaria.

Material Culture

Villages.—Villages are fortified with dense cactus hedges in the south, but are usually open in the north. There are no elaborate fortifications except among the Bara, who probably borrowed the idea from area 2. There are almost no isolated dwellings, and much of the country is deserted, villages being built near water and many miles apart.

Houses.—They are usually of reeds with a wooden framework and are built on the ground, with earth floors. Very small wooden houses of vertical planks with clapboard roofs are used in the extreme south.

Granaries.—Granaries are lacking.

Clothing.—Clothing is much as in area 2 in early times except that on the coast the men often wear a skirt instead of a loin cloth and the lamba is rarely worn in the extreme south. In the extreme south the men usually wear caps of matting or hide, elsewhere both sexes usually go bareheaded.

Exposure.—It is carefully avoided by men, less so by women. Even three and four year old boys wear the loin cloth.

Ornaments.—Ornaments, especially strings of beads, necklaces, and bracelets, are worn in profusion by women, and there is a marked love of bright colors. Ears of both sexes are pierced and the Sakalava of the central region expand women's ear lobes and wear large plugs of silver or gold.

Hairdressing.—This is very elaborate and is nearly the same for both sexes, varying with the tribe. Very fantastic styles have recently been introduced among the Bara.

Tattooing.—This is common, but not elaborate, and both sexes are often marked on the face. It has no significance. Scarification also occurs sporadically throughout the area.

Spinning and weaving.—They are universal but only moderately developed. The spindle is used everywhere. In the north both have become almost obsolete, due to long foreign contact. In the south the loom is long and straight, without rollers, and the weaver works from the side, using a sword-shaped batten with a handle at one end. (Elsewhere in Madagascar the weaver works from the end and uses a simple batten without handle.) The principal material is cotton with a little wild silk. Among the central Sakalava the warp-dyeing process is highly developed, but seems to be due to Imerina influence. The southern tribes do fine figure weaving on the ends of loin cloths, and also employ wide borders of woven beadwork in colors.

Bark cloth.—It is known traditionally on the coast, but is entirely obsolete. Among the east Bara it is still used extensively

but as a result of Tanala influence. The manufacture is like that of area 2.

Hide garments.—Garments of rawhide scraped and pounded soft and dyed black, were worn by the east Bara but are now almost obsolete.

Mats.—They are used primarily as floor covering. The work is rather coarse and there is little decoration except among the Bara, who employ fine woven designs but little color. Sakalava mats are often painted in designs which followed the weaving. The east Bara employ mats of area 1 type for clothing. Food mats are also used. In the north, mats made from narrow woven strips, identical with the Swahili type, are in occasional use. This is said to be due to Commorean influence.

Basketry.—This is well developed and there is a great variety of odd forms intended primarily for decoration. Small baskets are often painted or embroidered. The matting technique is commonly employed, but there is some coiled basketry in the north.

Pottery.—This is well developed in the north, where the old ware was black with fine incised decoration or punctures filled with lime. It becomes poorer as one goes southward and the Vezo, in the extreme south, say it is a recent innovation. In early times they cooked in the *earth oven* as in Polynesia. The Bara make pottery of good grade.

Utensils.—Utensils, other than wooden spoons, are commonly made from gourds. The typical bowl of the area is a gourd cut in two lengthwise. A few wooden bowls are made, but they are important only among the Bara. In the far north, food mats like those of area 1 are employed. Gourds are often etched and the wooden spoons were nearly always carved.

Agriculture.—This was relatively poorly developed. In early times the staple food is said to have been sweet potatoes and is now manioc. Very little rice was grown, and large areas well suited to it had never been brought under cultivation. Millet, maize, and taro were grown but were unimportant. There were no terrace systems, no fertilization, and at least one group had a taboo against irrigation.

Domestic animals.—The old domestic animals were cattle, dogs,

and chickens. Goats seem to have preceded sheep, and the latter have only reached the north within the last two or three generations. Pigs are taboo almost everywhere. Only cattle and chickens are sacrificed.

Cattle.—They are the life of the people. They are kept in fenced pens and in the south the houses of the family are grouped around the pen and open into it. Milk is the principal article of diet and is soured at once by leaving a little of the old sour milk in the milking jug. In the south the ordinary dish is a mixture of curds and fresh milk. Although the natives have enormous herds, the animals are only killed for funerals or sacrifices.

Dogs.—Dogs are highly valued and are used for hunting and herding. There are two varieties, a small jackal-like animal and a large one somewhat like a mastiff. The latter is used for hunting wild pig, and a calf is sometimes given for a good one.

Fishing.—Fishing is important, with hooks, nets, spears, and fish traps. Turtle fishing was a specialized industry and there is said to have been whaling in the south.

Canoes.—Canoes, even when for river use, are provided with the outrigger. Two canoes are lashed side by side for long voyages. The sail is in the form of an inverted triangle, supported by two poles of equal length. In the south a sort of rudder or lashed steering oar was employed. Paddles are long and narrow with a cross grip.

Metal-working.—This is highly developed. Practically all weapons and tools are well made and there is a great deal of inlaying with brass and copper. Ornamental ironwork is lacking, but the Bara do clever casting in brass and even silver, using the lost wax process.

Weapons.—The eyed axe was in universal use and the cleaver type rare or lacking. The main weapon was the spear. In the south the sling was very important. The sword was not used, and the ancient use of shields is doubtful. Well-made clubs of rectangular section seem to have been important in early times. Blowguns with heavy iron-tipped darts were used by the Sakalava for hunting, but were not poisoned. The bow was hardly known, but the Tsimahety, a tribe marginal to the area on the north, used it with poisoned arrows as their principal weapon.

Social Organization

The gens was the basis of organization, but the political groups seem to have been larger and more closely knit than in the other two areas. Kingship seems to have been vested in families rather than gentes, and there were no noble gentes.

Kings.—The king was an absolute monarch and was treated with exaggerated respect. He acted as a supreme court, receiving part of the fines levied, and was paid tribute by his subjects. He was owner of forest and grazing land, which the whole tribe used rent free, but had his own cultivated land and could not sequester that of a commoner. Members of the royal family could take anything belonging to a commoner except cattle or silver. He might act as a war leader. Among the Vezo the royal power was vested in a sword, and the person who succeeded in getting this became king by virtue of it.

There was a *palace group* composed of royal messengers, etc., who were themselves commoners, but these do not seem to have been limited to any gens.

Slaves.—They were numerous, and their status much as in area 2.

Marriage.—It is usually endogamous, although there is no fixed rule. Children of sisters can not marry, or half-brother and sister, but marriage of two brothers or brother's and sister's children is strongly approved. The family is strictly patrilineal, and in marriages across caste lines the child took the father's rank even if the mother was a slave. Formalities of marriage are much the same as in areas 1 and 2. The young people practically always have intercourse before approaching their parents on the subject.

Polygamy.—This is normal and the rights of the various wives are rigidly guarded, the whole being much better organized than in the other areas. The first wife has equal rights with the husband in all property except cattle which he owned before the marriage. Her consent is necessary for all subsequent marriages. Each wife has her house, her land, and her day of the husband's company. Profit from the land goes one-half to her and one-half to the husband. Her share is her absolute property and in divorce she takes it with her.

Polyandry.—This exists only in the case of blood brothers.

Chastity.—Chastity before marriage is unknown. After marriage the wife's unfaithfulness is punished by divorce, while the husband who is guilty has to pay a fine to the wife on whose day the offense occurred. The other wives pay no attention to it.

Divorce.—This is usually by mutual consent, and the property is divided, the wife taking her half of even the cattle. If divorced for some offense, she gets nothing. If she divorces the man for the offenses noted in area 2, she retains full property rights. A divorced woman must have her husband's consent to remarry, and if she wishes to marry a lover on whose account she has been divorced the husband has the right to demand the first children of the new union up to three. These children are adopted and treated as his own.

Property and inheritance.—Cultivated land is held in severalty, but if allowed to lie fallow may be sequestered by the village council and redistributed. It was rarely sold even within the group. In inheritance the property of all sorts is divided equally among the children irrespective of sex or seniority of mother, and the mothers hold and work it as trustees for the children.

Religion

Ancestor worship.—Ancestor worship is pre-eminent. Each gens has its hereditary sacrificial priest, who is assisted by the person who will succeed him in office. He performs all but the smallest sacrifices and is a real intermediary between the members of the gens and their ancestors. There are special insignia of office which are inherited. At the death of a priest the office remains vacant for a year, after which the new priest is formally invested.

Andriamananary.—He is the supreme being and is rather clearly personified. He lives above the sky and the ancestors spend most of their time with him and derive their powers from him. He is never prayed to alone. The idea of dualism is present, and the southern tribes pay great respect to and even worship a second spirit whom the Vezo and Mahafaly call

Andriamandresy.—This god lives on or under the earth and

sends storms, sickness, and evil of all sorts. Ghosts who possess living persons are thought in some way to derive their powers from him, although the ideas are very vague in the native mind. Sacrifices are made to him at tamarind trees.

Sacrifices.—They are performed at sacred posts, if to the ancestors.

Vazimba cult.—The Vazimba cult is lacking.

Idols.—Idols, in the strict sense of the term, are lacking, but in the north nearly every group has one or more sacred objects which assume that character.

Dead kings.—They are worshipped by the northern groups, but not in the south.

Sacred places.—Sacred places, especially sacred trees, are fairly numerous, but none of them appear to have priests and the character of the beings worshipped there, aside from Adriamandresy, are vague in the native land. At least one of the Mahafaly gentes has a sacred tree in which the umbilical cords of all its members are placed.

Sacred rivers.—They seem to exist in the northern part of the area, but little information could be obtained.

Ombiasy.—They are extremely important and are always men. They make charms, practise the vintana and sikidy, and there are special ones who know a form of astrology. This last requires many years of study. Some of them claim possession, others keep a powerful charm in their houses from which they derive their powers and for which they demand sacrifices. The line between ombiasy and priest is clearly drawn and if an ombiasy succeeds to the priesthood he must at once abandon his earlier practices or be suspected of sorcery. They seem never to direct sacrifices to the ancestors.

Sorcerers.—They are important but seem to be less feared than in the other two areas. In the south they seem to be confused with grave robbers.

Possession.—This is highly developed and seems to be usually by the souls of dead kings.

Charms.—They are very important and are worn by practically all natives. They cover all phases of activity.

Disposal of the Dead

In the north individual earth burials in secluded cemeteries are the rule. In the south the dead are placed in large blocks of rough stone masonry. Here a husband and wife or parent and child may be buried in the same block, but single burials are the rule. The southern tombs are usually in prominent places. The northern groups took relics of dead chiefs consisting of a part of the frontal bone, a tooth, finger nails, etc., which were kept in tomb houses, taken out, and rewrapped from time to time, etc.

Souls of the dead go to the sky world where they live with Andriamananary. There is no distinction on conduct except that Andriamananary will not allow evil souls to approach him and they are forced to wander on earth. Some groups seem to believe in transformation into animals somewhat as in area 2.

Menhirs are unknown except among the Bara and even here they are only erected by the common gentes, never for royalty.

Art

Carving is highly developed, being used on houses and utensils and on tombs. There is also a love of pure decoration unusual in a primitive people. The walls of houses are often hung with ornamental baskets which served no purpose. Small carvings are exhibited on shelves, etc. The designs used in weaving, matting, and basketry are often very fine. The carving shows a distinctly African quality.

A mass of details have necessarily been omitted in the above summary, but I hope that enough has been given to show that the generally assumed uniformity of Malagasy culture is a myth.

Field Museum of Natural History,
Chicago, Illinois

MAYA INSCRIPTIONS VI

THE LUNAR CALENDAR AND ITS RELATION TO MAYA HISTORY

By JOHN E. TEEPLE

RECENT study of Maya inscriptions, particularly those containing dates and moon series attached, has given the writer an historical picture of Central America which may or may not be correct, but is at least suggestive. The territory covered extends from the Peten district on the northeast to Copan on the southeast, to Palenque on the west, and probably to the mountains on the southwest. The records start in the Peten district in the northeast about 8.14.0.0.0 (317 A.D.)[1]. They had extended to Copan probably by 9.1.0.0.0 (455 A.D.) and to Palenque by 9.4.0.0.0 (514 A.D.), and during the next hundred years had appeared at most of the intermediate places with which we are familiar.

The picture we get of this region from 9.0.0.0.0 to 9.12.10.0.0 (435 A.D. to 682 A.D.) is that of a considerable number of more or less independent communities united by the use of the same calendar, the same general system of hieroglyphic writing, and similar lunar calendars. Their lunar calendars all agree at any given date, within a day or two, on the age of the moon. They may differ on whether the moon is 19 or 20 days old at a given date, but the agreement is as close as we could expect if the statement of the age of the moon is based on observation and not on a fixed calendar. At least there is no evidence of an uncorrected cumulative error. There is, however, a wide difference in their statements regarding the position of the moon in the lunar year. Whether at a given date the moon is the first or the third or the sixth moon of a lunar half year differs from city to city.

[1] Christian dates throughout this article are given only for ease of comparison and not as statements of fact. I have used the correlation first suggested by Goodman and later revived by Martinez and Thompson, placing 11.16.0.0.0 about November 3, 1539 Julian, not because I feel it is yet proved, but because it is the only one so far suggested which shows fair agreement with the astronomy of the inscriptions, and at the same time has some definite support in the early Spanish period.

Apparently at this stage the Maya were undergoing the effort which almost all people have gone through: they once had a lunar calendar, later discovered a better approximate solar calendar, and were endeavoring by interpolation of whole moon months from time to time to keep the lunar calendar in some sort of relation to the solar calendar. This is a familiar picture in all history. The calendar was in the hands of the priests, and the priest in authority inserted the additional moons at whatever period seemed best to him, or omitted them when he liked. So long as he dealt with the insertion or omission of whole moons, however, the days from new moon would be uniform throughout the territory, and this we find to be the case in the Maya region.

From the earliest contemporary statements of the position of the moon now available, say at 8.16.0.0.0 (356 A.D.) to the latest one 10.2.9.1.9 (878 A.D.), a period of over 500 years, we have over one hundred rather complete dates with moon series attached. Since the age of the moon is so nearly uniform throughout, never varying more than a couple of days from the calculated mean, we may assume that we are dealing with observation data and not with a formal calendar, or if it is a formal calendar it is then so frequently corrected by observations that no cumulative error can be traced. The positions of the moon in the lunar year, however, lacking this uniformity, may be traced as a symptom or trait, and by this symptom we are able to divide the whole 500–600 years of Maya occupancy into three parts, based on the treatment of the lunar year.

Period 1. Independence.—From the beginning to about 9.12.10.0.0 (682 A.D.). A period of non-uniformity when each city was apparently trying to coordinate its lunar calendar to its solar calendar by interpolations in its own way, and this way was different in different cities.

Period 2. Unity.—From 9.12.15.0.0 to about 9.16.5.0.0 (687 A.D. to 756 A.D.), during which the lunar calendar under the leadership possibly of Palenque was standardized into a lunar year of exactly 12 moons, and any attempt to correlate it with the solar year or the Maya year was abandoned. This standardization proceeded rather rapidly from city to city until, by 9.13.0.0.0

Fig. 1. Piedras Negras, stela 1.

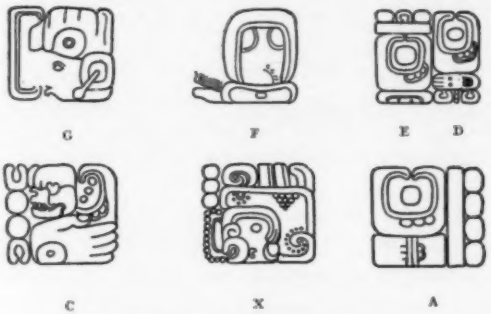

Fig. 2. Piedras Negras, stela 3.

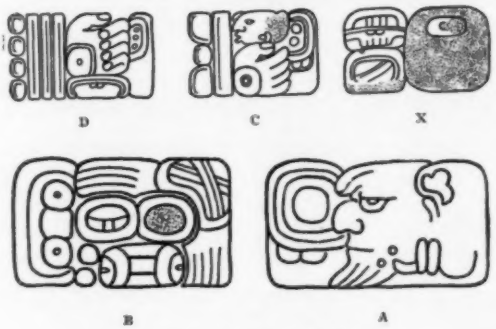

Fig. 3. Naranjo, stela 29.

(692 A.D.) every city that was erecting monuments had adopted it.

Period 3. Revolt.—From 9.16.5.0.0 to the latest dates (756 A.D. to 878 A.D.). At the beginning of this period Copan abandoned the standard lunar year and adopted instead a lunar year to coincide approximately with the eclipse periods, giving thus an occasional lunar year of only 11 moons, such as we find in the eclipse table of the Dresden Codex. The other cities did not immediately follow this lead (but ultimately it looks as if Naranjo did). Quirigua abandoned the standard method at about the same time but did not follow the Copan method, and thereafter pursued an independent course, finally reverting to the standard method for the moon numbers but disagreeing with everything on the age of the moon. Soon after this the erection of monuments with complete dates seems to have ceased and we cannot follow the question further.

This is a rough outline of the history of one symptom, trait or idea, as I interpret it, but it may be suggestive in showing relationships that will lead to something more important than the mere status of the lunar calendar.

The Standard Calendar

During the period of unity the practice in all Maya territory, so far as we know, was so uniform that a description of the different g'yphs at that time may be of interest. (See figs. 2, 4, and 6.) (Figures illustrated have been taken from Dr. Morley's drawings in the Holmes Anniversary volume.)

Glyphs G and F.—I have nothing of interest to add to what has already been so clearly stated by Dr. Morley. Glyph G seems to refer to the sun, and glyph F is always associated with the moon series or a lunar computation. Beyond this I do not know their meaning.

Glyphs E and D.—Glyph E is used when the age of the moon is 20 days or over, the coefficient of E being added to 20 to determine the number of days from new moon. Glyph D is not counted unless it has a coefficient. If it has a coefficient then glyph E never has one. The coefficient of glyph D represents the number of days from new moon when the days are less than 20.

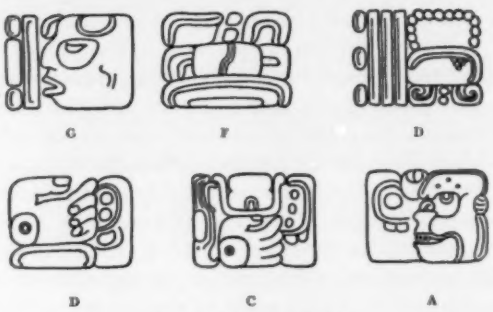

Fig. 4. Naranjo, stela 24.

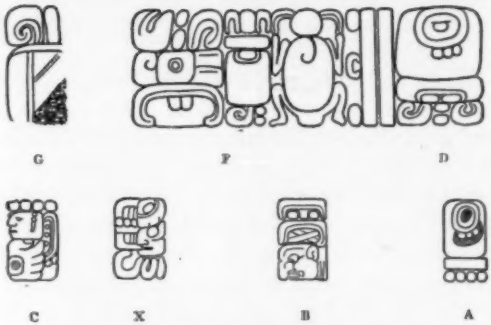

Fig. 5. Yaxchilan, stela 11 (front).

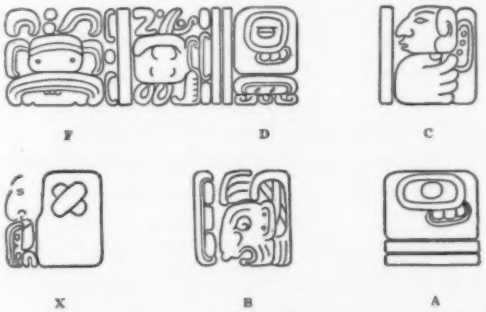

Fig. 6. Yaxchilan, stela 11 (side).

There are three possible positions from which new moon might be counted. First, from the disappearance of the old moon; second, from the actual conjunction; or third, from the first appearance of new moon. During the period of the standard calendar I am inclined to think the count was from the first appearance of new moon, or possibly from conjunction, while during the period of independence the count began earlier, probably from the disappearance of the old moon. There was apparently a one-day change at the time of the introduction of the standard calendar, and this would be just about the amount necessary to change from the disappearance of the old moon to the first appearance of the new moon. In Spanish times Bishop Landa states that "the count of the moon was from the time when it rises new," and this probably means from the appearance of new moon rather than from the conjunction some hours earlier.

It should be mentioned again that the count of D and E was essentially uniform and in relation to observation no matter whether we are in the period of independence, of unity, or of revolt.[2]

Glyph C.—The coefficient of glyph C probably indicates the number of completed moons since the end of the last lunar half year, but we cannot overlook the possibility that it might indicate the number of the current moon. A series of faces either indicating numbers or gods form a part of glyph C, but I do not understand their significance. They may place the month in the lunar year since the numbers from 1 to 6 only place it in the lunar half year, but it seems to me more probable that they represent divinities to whom the particular moon was consecrated.

Glyph X.—This glyph is the most variable of any in the series, and inspection shows that its variation is associated with the number of the moon in the moon half year, i.e., with the coefficient of glyph C, regardless of the position of the date in relation to the tun, the Maya year, or the tropical year. If the coefficient of C is changed for any given date, then X changes accordingly

[2] The first record is 8.16.0.0.0 at Uaxactun recorded 5 E. The last entirely trustworthy one is 9.18.10.0.9 at Naranjo recorded 1 E. From these we deduce 162,004 days for 5486 moons, which checks absolutely with 162,004 or 162,005 days formed from modern moon tables.

although the Maya day, month, and long count remain unchanged (see figs. 1–6).

Any given glyph for X seems to be associated with two adjacent moon numbers, as though X might give a name or a description to thirds of the lunar half year, that is, to 2 consecutive moons. For example, the glyph for God C (see glyph X in fig. 2) never occurs unless the glyph C coefficient is either 1 or 2. This form of X is present in nearly every case where the coefficient of C is 1, and in not quite half the cases where C is 2. One other form of X is found three or four times (see fig. 7), and this form only occurs when C is 2.

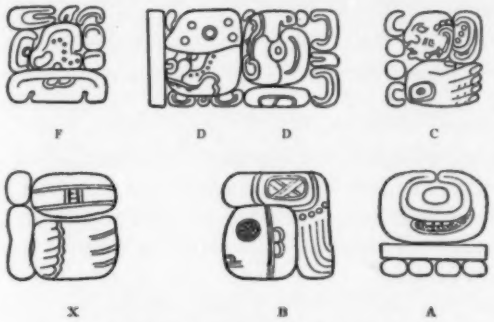

Fig. 7. Palenque, Temple of The Cross.

In figure 1 the glyph for X shows prominently a pair of crossed legs. This is a very common form of the X glyph but is never used unless the C coefficient is either 3 or 4. The only exception to this so far as I have found, is in lintel 29 at Yaxchilan where X is represented by crossed legs and C is apparently 5. A face with the tun sign, a 10 tun sign, or the Zero sign before it (see glyph X in fig. 5) is found when the C coefficient is either 4 or 5. The one exception to this is on stela 14 at Piedras Negras, where this combination occurs with 3C instead of 4 or 5C, but in this particular case the date given is only 3 or 4 days before 4C. In the form of glyph X shown in figure 3 the upper left-hand part of the glyph appears only in connection with 6C. This same symbol

occurs on the usual face numeral for 12 and is fairly common in the inscriptions. I think it is likely the sign for the 12 moon lunar year. It is a very old glyph, as old as the Leyden plate, whose date shows the end of a moon and probably a lunar year.

A few other glyphs are repeated once or twice, but the above sufficiently indicates that glyph X refers to certain divisions of the lunar half year, associated with the number of the moon in that period. We probably, however, have insufficient data to recover these divisions and reconstitute the year exactly.

Glyph B.—Glyph B is very uniform in all inscriptions. It contains an ending sign prefix, an elbow with crossed bands, and within the elbow either 2 circles and an oval (fig. 3) or an animal head, possibly a jaguar (figs. 1, 5, 6). I take glyph B to signify that the end of a moon will be a 29 or a 30 day moon as shown in glyph A immediately following it, but whether the reference is to the current moon or to the recently completed one is uncertain.

Glyph A.—Glyph A with coefficient 9 indicates a 29 day moon, and with coefficient 10 indicates a 30 day moon. This has been known for a long time. This is one place where we get some indication that the lunar calendar might have been a formal one. If we examine the occurrence of 29 and 30 day moons we find more regularity than the laws of chance would lead us to expect. When glyph C is 1, 3, or 5, the number of 30 day moons is nearly 3 times the number of 29 day moons, and when glyph C is 2, 4, or 6, the number of 29 day moons is nearly 3 times the number of 30 day moons. This indicates a certain formalizing of the calendar with alternating 29 and 30 day moons, but there are a good many exceptions, more than would be necessary simply to keep a formal calendar in adjustment.

Also we find that when at Piedras Negras a date was changed from 3C to 2C (figs. 1, 2) glyph A was changed from 30 to 29. At Naranjo a change of C from 6 to 1 was accompanied by a change in A from 29 to 30 (figs. 3, 4), and at Yaxchilan a change of C from 4 to 5 meant a change of A from 29 to 30 (figs. 5, 6). The general tendency was evidently for an odd C to be associated with 30 days in A, and an even C with 29 days, and this indicates

the possibility of a formal lunar calendar, which however must have been corrected at very frequent intervals so that it was never more than 1 or 2 days out of adjustment with observation.

Other Glyphs.—Between glyph F and glyph E there sometimes occurs a small kin sign with arms and legs. This is in most of the inscriptions at Yaxchilan (see figs. 5, 6), in the two that are known from Ixkun, in the one from Holactun, and in one from Copan. I have no idea what it means nor how to use the numerical coefficient often associated with it, nor do I understand the coefficients 5, 7, or 9 often attached to glyph G.

The above gives a summary of the standardized moon series so far as we can explain it. This form was used universally in the Maya area from 9.12.15.0.0 to 9.16.5.0.0, and in some places later. It is a uniform lunar half year of six moons with no moon interpolations and no attempt to reconcile it with the solar year, the Maya year, or the tun. It was, however, in close agreement with actual moon movements. The count of the moon age was probably from the actual appearance of new moon. The calendar was likely formal in its arrangement of 29 and 30 day moons, but if so it was corrected by the addition of a day often enough to keep it in correspondence with the actual new moon.

Evidence for Standardization

Our thesis is that a period of independence in numbering the moons of the lunar calendar was followed by a period of uniformity. The uniform calendar may be defined with sufficient precision as one which would write 9.16.0.0.0 as about 5C 5D, i.e., 5 days and 5 moons after the beginning of a lunar half year, all lunar half years being exactly six moons. The evidence will be of two kinds; first, a series of double dates like the three pairs, illustrated in figures 1–6, and second a list of dates from each city showing agreement after adoption of the standard, and lack of agreement before. It will be simpler to consider the cities separately. While the movement probably began at Palenque, the spread to other cities will be given first.

1. Piedras Negras.—Standard lunar calendar adopted between 9.12.10.0.0 (682 A.D.) and 9.12.15.0.0 (687 A.D.) and used until

9.18.0.0.0 (790 A.D.). For a point of departure the date 9.12.2.0.16 (674 A.D.) was selected and its date stated in terms of the old calendar (fig. 1) as 3C 8E and of the standard calendar (fig. 2) as 2C 7E. These statements were made about 20 years after the adoption of the calendar.

DATES IN STANDARD LUNAR CALENDAR

		Glyph C given	*Glyph C expected*
Stela 6	9.12.15.0.0	4	4
" 2	9.13.5.0.0	6	6
" 4	9.13.10.0.0	-	1
" 1	9.13.15.0.0	2	2
" 3	9.14.0.0.0	3	3
" 5	9.14.5.0.0	4	4
" 7	9.14.10.0.0	5	5
" 11	9.15.0.0.0	-	1
" 9	9.15.5.0.0	2	2
" 10	9.15.10.0.0	3	3
" 40	9.15.14.9.13	4	4
Altar 2'	9.16.0.0.0	-	5
Stela 16	9.16.15.0.0	2	2
" 13	9.17.0.0.0	-	3
" 3	9.12.2.0.16	2	2
" 8	9.11.12.7.2	5	5

The last two dates of course are on monuments erected after 9.12.10.0.0

DATES DURING PERIOD OF INDEPENDENCE

		Glyph C given	*Glyph C expected*
Stela 38	9.12.10.0.0	2	3
" 39	9.12.5.0.0	-	2
" 37	9.12.0.0.0	5	1
" 35	9.11.9.8.6	-	5
Lintel 2	9.11.6.2.1	5	6
Stela 1	9.12.2.0.16	3	2
" 36	9.10.6.5.9	4	5
" 31	9.10.5.0.0	3	1
" 26	9.9.15.0.0	5	5
" 25	9.8.10.6.16	3	5
" 30	9.5.0.0.0	5	5

These two lists are rather striking. There are enough dates at Piedras Negras to give a clear picture, and thanks to the courtesy of Dr. Morley I have been able to study photostats of all his

drawings. During one hundred years after the adoption of the uniform calendar we have sixteen dates, and glyph C can be read in twelve of them. Without exception they are given as we should expect. During the preceding one hundred and fifty years we have eleven dates, and glyph C can be read in nine of them. Only two of the nine have the coefficient that we would compute and this is about the proportion we should expect from chance alone. This covers all Piedras Negras dates except two late ones after 9.18.0.0.0. Hence we conclude definitely that at 9.12.10.0.0 (682 A.D.) Piedras Negras was still using her old lunar calendar and at 9.12.15.0.0 (687 A.D.) she had adopted the new one.

2. Copan.—Standard lunar calendar adopted by 9.13.0.0.0 (692 A.D.), the computations being made on altars H′ and I′ and point of departure being date 9.12.8.3.9. There are 15 dates on monuments pretty surely constructed before 9.13.0.0.0 (692 A.D.) where C can be read. Only one has the C coefficient we should expect from the uniform calendar. This is 9.10.19.13.0 on stela 10, and even it may be of later construction. Then comes the date 9.13.3.7.8 on the hieroglyphic stairway, date of writing not known and reading not sure, then uniformity, as follows:

		Glyph C given	*Glyph C expected*
Altar H′	9.12.8.3.9	5	5
Stela J	9.13.10.0.0	1	1
" 5	9.13.15.1.0	3	3
" A	9.14.19.8.0	6	6
" D	9.15.5.0.0	2	2

Entire agreement, and no more dates given until 9.16.5.0.0 when something entirely new starts at Copan.

3. Naranjo.—Uniform lunar calendar adopted at least as early as 9.13.10.0.0 (702 A.D.) when stela 24 was erected, and probably earlier. Point of departure used 9.12.10.5.12, which is given on stela 29 (fig. 3) by their old calendar as 6C 19D, and on stela 24 (fig. 4) by the uniform calendar as 1C 18D. There are no earlier dates with moon series. Then comes stela 22, 9.12.15.13.7; if the coefficient of C here is 1 it agrees with the uniform system. Stela 23 the date is doubtful.

		Glyph C given	*Glyph C expected*
Stela 30	9.14.3.0.0	4	4
" 13	9.17.10.0.0	4	4
" 14	9.17.13.4.3	3	2
" 8	9.18.10.0.0	2	2

One disagreement, probably showing revolt.

4. Yaxchilan.—Date of adoption doubtful due to absence of contemporary dated monuments. It may have been as early as 9.12.15.0.0, the same as Piedras Negras. Double dates are given on stela 11 showing 9.16.1.0.0 as 4C 12D by the old system (fig. 5) and 5C 12D by the uniform calendar (fig. 6). Also date 9.0.19.2.4 is given correctly on a late monument as 3C. During the period of independence we have only two dates, on stela 6 and altar 44, neither in agreement with the uniform calendar After 9.12.10.0.0 we have all in agreement. I have omitted only the date on lintel 26 which is a doubtful reading.

		Glyph C given	*Glyph C expected*
Lintel 21	9.0.19.2.4	3	3
" 29	9.13.17.12.10	5	5
" 98	9.15.6.13.1	5	5
" 46	9.15.14.8.14	3	3
Stela 11	9.16.1.0.0	5	5
" 1	9.16.10.0.0	1	1

5. Quirigua.—This place was probably not founded until after the uniform calendar was in general use, so it started right, using as point of departure the date 9.14.13.4.17. Soon after 9.16.5.0.0 however, when Copan abandoned the uniform system, Quirigua abandoned it also, but not to follow the lead of Copan.

PERIOD OF UNITY

		Glyph C given	*Glyph C expected*
Altar S	9.15.15.0.0	4	4
Stela H	9.16.0.0.0	5	5
" J	9.16.5.0.0	6	6
" E	9.14.13.4.17	3	3
" D	9.16.13.4.17	4	4

The last two dates are on later monuments erected after the standard system had been abandoned and purposely dated back according to the abandoned system, although the main dates on the same monuments are not.

PERIOD OF REVOLT

		Glyph C given	*Glyph C expected*
Stela F	9.16.10.0.0	6	1
" D	9.16.15.0.0	1	2
" E	9.17.0.0.0	2	3
" A	9.17.5.0.0	2	3
" B	9.17.10.0.0	–	4
" G	9.17.15.0.0	5	5
" O	9.18.0.0.0	–	6
" P	9.18.5.0.0	4	1
" I	9.18.10.0.0	2	2
" K	9.18.15.0.0	3	3
Struct. 1	9.19.0.0.0	4	4

The last three dates for some reason return to the expected C glyphs, but they differ entirely from all other Maya inscriptions in the statement of glyphs D and E, the moon age count.

6. Other cities.—El Cayo was using the uniform system when the lintel having date 9.16.0.2.16 was placed. La Honradez in 9.17.0.0.0. Ixkun had probably revolted from it by 9.17.9.0.13. Tila had not begun its use in 9.12.13.0.0. Nor Tikal in 9.4.0.0.0. Chichen Itza was not using it in 10.2.9.1.9, nor Uaxactun in 10.0.0.0.0.

7. Palenque.—The situation at Palenque is confused owing tc the absence of contemporary dates with moon series. We actually have only one, 9.12.6.5.8, 5C 19D. If this reading is correct it does not agree with the uniform calendar, which calls for 6C at that date. On the other hand, the tablets at Palenque deal with long computations on the lunar year, extending thousands of years into the past, but do they favor or oppose the uniform system? In the distant past they were sure that 4 Ahau 8 Cumhu was 6C 4E, but their ideas about their present are not explicitly given in shape for us to read. If in the long computations at Palenque they used the factor 11.0.0.0 = 2682 moons or 223½ lunar

years, as seems probable and as was apparently done at Copan, then computing from the ancient dates we find their contemporary dates agreed with the uniform calendar. If they used the factor 1.13.4.0 of the Dresden Codex then they were in error 1 moon. I think they used the 11.0.0.0 factor, and so were in agreement when the tablets were written in 9.13.0.0.0 or earlier.

Three indications make me think that Palenque probably originated the idea.

First, the tablet in the Temple of Inscriptions seems to indicate that 9.12.0.0.0 was 2C, which would agree with the new calendar, but the statement is vague and inconclusive.

Second, when the other cities adopted the new system they often seemed to take dates that were important at Palenque for their point of departure. Yaxchilan selected 9.0.19.2.4, 3C 7D, which is just 243 lunar years (3 to the 5th power if that means anything) from the Palenque 3 Caban 15 Mol. Quirigua selected 9.14.13.4.17, 3C 7D, just 1 moon period of 1.14.17.0 or 35½ lunar years from the same date. The first contemporary date given correctly at Copan in the uniform system 9.13.10.0.0 is just 20 lunar years from the double date used at Naranjo, 9.12.10.5.12, and the latter in turn seems to be based on the one stela cited above from Palenque.

Third, in each case of double date, besides altering the moon number to agree with the uniform calendar, the cities have also decreased the moon age by 1 day (I am not sure whether this was done in the double date at Yaxchilan). This means to me that the uniform calendar began the month with first appearance of new moon, while the older custom had been in most cases to begin the month about a day earlier after the disappearance of the old moon. At Palenque the same thing is probably expressed by changing from 2 Cib 14 Mol to 3 Caban 15 Mol, leaving the moon age unchanged.

These three things indicate that Palenque was an early and important part of the movement, possibly as originator, possibly as one of the earliest converts, possibly as an opponent. Her history ceased so soon after 9.13.0.0.0 that she may have been a conqueror moving into new territory and leaving the old

site, or she may have been an opponent vanquished or driven away.

Period of Revolt

We have seen evidence of independence in Period 1 (up to 9.12.15.0.0), evidence of unity in Period 2 (during the next 70 to 120 years), and we now come to Period 3, the revolt. The first evidence is from Copan in the extreme southeastern corner of the territory. In 9.16.5.0.0 when all was harmony she erected stela M. Its lunar date at that time would have been written in any city in the Maya territory as 6C 4 or 5D. Copan deliberately dated it 5C 5D. Stela N in 9.16.10.0.0 by her new system was dated 1C 1D, but accidentally the standard system would have agreed on 1C also. Her third date, 9.16.12.5.17, 6 Caban 10 Mol, by the standard calendar would have been 5C and about 12D, but Copan dated it 6C and probably 12D. The altar which commemorates this event shows the famous astronomical congress in session. It was a very important occasion. In fact I consider it very probable that in these three monuments we have the origin of the method of making lunar years accord with eclipse syzygies as shown in the Dresden Codex table, but that does not concern us now.

Copan broke away from the uniform system, and five years later Quirigua on stela F (9.16.10.0.0) wrote 6C when every other city was writing 1C. Quirigua was never afterward in complete agreement with the standard calendar, except once in 9.17.15.0.0 and this was probably accidental. Indeed, in stela C she broke away entirely from the Palenque computation that 4 Ahau 8 Cumhu was 6C 4E and wrote it 3C 6E. The extreme southeast was gone. In 9.17.9.0.13 Ixkun disagrees, in 9.17.13.4.13 Naranjo does, and after 9.18.0.0.0 Piedras Negras disagrees for the first time in over one hundred years. The dates are becoming very scarce and we cannot follow them much further. After 9.18.0.0.0 I find only one single date in agreement with the standard calendar (9.18.10.0.0 at Naranjo), and this may be an accidental one. Soon afterward historical monuments here all cease. Unfortunately up to the present there is nothing available to enable us to bring Yucatan into the picture.

SUMMARY

We have indicated fairly clearly the nature of the lunar calendar and the use of most of the glyphs in the moon series, at least during the period of uniformity. We have been able by this trait to trace the Maya cities through two or three hundred years of independence, followed by less than one hundred years of complete unity, magnificence, and artistic effort, and this in turn ended by revolt or progress, and later speedy decline or abandonment.

We have determined fairly well when this movement affected each city and for how long. At Piedras Negras it began after 9.12.10.0.0 and before 9.12.15.0.0, and was ended at least by 9.18.0.0.0. At Copan it began after altar K, 9.12.16.7.8 and before 9.13.0.0.0, and ended by 9.16.5.0.0, being then succeeded by a new movement either of revolt or progress. At Quirigua it began with the city and ended by 9.16.10.0.0, being succeeded by a movement which lasted until 9.18.0.0.0, when it in turn was succeeded by something else. At Naranjo it began surely by 9.13.10.0.0 and probably somewhat earlier, and was apparently ended by 9.17.15.0.0. At Yaxchilan it probably began as at Piedras Negras by 9.12.15.0.0, but we have no proof before 9.13.17.12.10, nor have we any evidence when it ceased, lacking legible inscriptions after 9.16.10.0.0. At Palenque it apparently began after 9.12.6.5.8 and before 9.13.0.0.0, but we know nothing of its future history there.

We do not know the nature of the unifying influence. Was it intellectual, led by astronomers, or religious under the prestige of a Pope Gregory, or political by force of arms? Only political power and possibly conquest would seem adequate to effect such complete unification in less than ten years, as well as to account for the subsequent revolt beginning at the most remote points. Up to 9.12.10.0.0 no city was using the standard lunar calendar so far as we know; by 9.13.0.0.0, less than ten years later, we can find no city that was not using it. Did the movement originate in Palenque, or were Palenque and Piedras Negras simply the first cities in the path of an impulse coming from the northwest?

What other traits can be traced in company with the calendar? What of new appears at Piedras Negras in 9.12.15.0.0 that was

never there before? What new impulse do we find reaching Copan by 9.13.0.0.0, and is it followed by another impulse of different nature in 9.16.5.0.0, or do we see only progress with no real break? The changes of lunar calendar shown above may furnish us a structural framework into which other variations may be fitted until the history of the people finally appears, but for the moment the chief result is to suggest a lot of questions and lines of investigation.

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MENTAWEI SOCIAL ORGANIZATION

By EDWIN M. LOEB

THE Mentawei islands lie 100 degrees east of Greenwich, and extend from the equator 5 degrees south. They belong to a general group of islands lying west of Sumatra, of which Nias is the more important to the north, Engano to the south. The Mentawei islands are at present under the Dutch government. At the time I visited Mentawei, the spring of 1926, the permanent residence of the Dutch lieutenant in charge was in the large northern island, Siberut. A detachment of native soldiers was stationed in the intermediatary island, Si Pora, and another detachment at North Pageh, the northernmost of the two Pageh islands. I did all of my work on North Pageh, spending five months. The resident German missionary aided me in learning the native language, in obtaining information from the natives, and in lending me the aid of his Christian Batak teachers, who wrote down texts from the verbal information given by the indigenes.

The natives of the Mentawei islands belong to the Malayan race, with but a trace of Veddoid influence. The latter gives rise to occasional wavy hair types. Culturally, compared to other Malayan peoples, the Mentawei islanders belong at the bottom of the ladder. Due to their isolation, the waves of early Hindu and later Mohammedan influence left them untouched. For this reason Hindu traits, which were introduced elsewhere into the Malay archipelago and the Philippines, are absent in Mentawei. The more important of these traits are: rice culture, the smelting of iron, pottery, cotton and cotton weaving, work in stone structures, betel-chewing, and the development of chieftaincy. In the religion of the Mentawei islanders some trace of Hindu influence can be seen in the customs of chicken and pig sacrifice, the communal meal, and the arts of divination, especially that of hepatoscopy. On the other hand, the mythology of Mentawei has remained untouched by Hindu influence.

Concerning the original home of the Mentawei people little is

known. Dr. Karny has surmised[1] that the Mentaweians emigrated from Sumatra to Nias, and thence to Siberut. From an account of the year 1621, Karny ascertained the fact that only Siberut was at the time inhabited. The Pageh islanders have retained traditions of migrations to the southern islands, and the founding of the first village in North Pageh, Taikako. At the present day there are certain linguistic and cultural differences between the three groups of the Mentawei islands; Siberut, Si Pora, and the Pagehs. These differences become accentuated in North Siberut, due probably to Nias influence. It is only in the latter region that head-hunting and the use of the shield are to be found. Little is known, however, of the Mentawei islands with the exception of the Pagehs.[2]

A very brief summary of the material culture and the religion of Pageh is essential to the understanding of the social organization. I shall make use of the word "Mentawei" rather than "Pageh" in this article, with the understanding that data mentioned were collected in the Pagehs, rather than throughout the islands as a whole.

The Mentawei islanders live in pile houses. These may be classified as follows: the *uma*, the *lalep*, and the *rusuk*. The *uma* is the communal house. It is utilized as council house, trophy house (for skulls collected in the hunt), reception house for visitors, dancing-floor, and sleeping-place for the men during *punen*, or religious celebrations. During these periods the men have to keep apart from women. The communal house is not forbidden to women, although it belongs more especially to the men. The building of this house entails a long period of *punen* (religious festival) and, in former days, a human sacrifice under the center pole. The *uma* and the surrounding family houses (*lalep*) compose the Mentawei social, political, and religious unit. Like the Bontok Igorot, the Mentawei village does not act as a unit. Each portion of the village has its own *uma*, and each portion is spoken of as an *uma*. While each *uma* has its own

[1] Dr. Heinrich H. Karny, Auf den Glückinseln. Natur. 1925.

[2] A not over reliable book was written on Si Pora, viz., Alfred Maass's Bei liebenswürdigen Wilden, Berlin, 1902.

rimtaa ,or sacrificing priest, the government of the *uma* is in the hands of all its adult men. The priest has no jurisdiction other than religious, and that only during *punen* ceremonies.

Both the communal house (*uma*) and the family house (*lalep*) contain altars at which the livers of chickens and pigs are given in sacrifice to the spirits. While it is the *rimata* or priest who sacrifices for the souls of all the members of the community (the *uma*), it is the house father (*ukui*) who afterwards sacrifices for the members of his household. Therefore, while the priest is surrounded by an elaborate network of taboos, the house father also is under many restrictions. The result of this circumstance is the seeking out of the position of *rimata* by men of lazy temperment, and the avoidance of marriage until late age by all men. A man cannot afford to be a house father (*ukui*) until he has children to help him in his labor. Both the priest (*rimata*) and the shaman (*sikerei*) are required by native custom to be married men. If they were single they might break some of the taboos of office.

The *rusuk* is any house which does not contain an altar. These houses may be situated in the banana fields of the men, or in the village itself. When they are situated in the fields they are usually spoken of as *sapou*, or field huts. Young men, young women, and widows or widowers commonly live in *rusuk*. The *rusuk* is free from taboos, and youths can eat what they wish there, or do otherwise as they will. The young people hold their love affairs in the *rusuk*. This matter will be referred to again when speaking of marriage. Finally, a man or woman who has been put out of the community (*uma*) lives in a *rusuk*. He then can take no part in the communal life and festivals of his associates. He is called a *si-pu-rusuk*. The individual is only put out of the community for serious cause, such as witchcraft. The individual must, before leaving the *uma*, summon his soul from the roll of the inmates of the *uma*. While he is living in *rusuk* he is not allowed to partake of sacred, or sacrificial, food. All deer and sea-turtle which he catches must be given to the members of the *uma*.

The clothing worn by the Mentawei islanders is very scanty, and of a primitive nature. The men wear a loin cloth made from tapa from the breadfruit tree (*artocarpus incisa*). The remainder

of their apparel is in the nature of decoration rather than clothing. Strings of red-colored rattan are worn, as well as imported glass beads and brass arm rings. The hair hangs over the left ear, and is tied to a knot at the shoulder. The clothing of the women is also very simple. When they are at home in the village they merely wear a strip of imported cloth around the lower portion of the body. This was formerly made of tapa. When the women go out they wear an upper dress, skirts and hat made from banana leaves.

The main weapon of the Mentawei islanders is the bow and arrow. For the purpose of shooting monkeys, and in war, the arrows are poisoned with *antiaris toxicaria*. For birds, blunted arrows are used. Spears were also formerly used in war, the iron heads being imported.

The most important decorations of the Mentawei islanders are their filed teeth and tattooing (*titi*). The latter is done by the aid of two little sticks. On one of the sticks is a vertical needle. This stick is tapped by the other stick. Small pricks are made in the skin in this manner, and the coloring matter, the darkened sap of the sugar cane, is inserted. A convex bow is started on the chin and comes down to the shoulders. Lines are also made over the breast to the pit of the stomach. The hips, arms, legs, and fingers are also tattooed. The tattooing on the women resembles that on the men, but is simpler in form. According to the belief held by Herr Börger, all tattooing was formerly connected with the religious festival (*punen*) system of the Mentawei islanders.[3]

The Mentawei islanders have two forms of boats. The first is a simple dugout canoe, without outriggers. The second is the large war boat (*kalaba*). The second boat can hold as many as

[3] According to information which I received while investigating the Mentawei *punen* system, the tattooing on the calf of the leg, the back of the hands, and the sides of the body, was the final form of decoration, and formerly was always done at the time of a special *punen*, *punen lepa*. This *punen* was held to wipe out the evil influence of blood spilled in the village. A special porch was constructed in front of the *uma* for the purpose of the tattooing, so that the blood would not fall on the ground. In the words of the informant, "The blood that flowed from the tattooing was for the purpose of covering the blood of the dead man." The tattooing on the upper leg of the men was always done just before marriage.

thirty men, is rowed, not paddled, and is fitted with sails. It is furnished with a roof and outriggers. The war boat was formerly used in the expeditions between islands, when feuds were to be settled, or a human sacrifice obtained. It is now still used for the purpose of going to the small uninhabited islands at the period gathered. The dugout canoe (*abak*) is used as a means of communication between villages, for fishing, and by the women in going to their submerged taro fields. The villages are all laid out in the interior of the islands, on the sides of the rivers. Formerly paths were scarce, and the boats served as the chief means of communication.

The food of the Mentawei islanders is chiefly fish (*iba*). Meat is also called *iba*. The pig, chicken, and dog (which is not eaten) are kept as domestic animals. Deer and monkeys are hunted with the aid of dogs. In Siberut the wild boar occurs, and is also hunted. The men cultivate fields of banana trees and sugar-cane. The women grow taro in fields which are inundated. Sago is prepared as chicken food, but is not eaten by the people. In Siberut sago and not taro is the main article of diet of the people. Rice is grown nowhere except in the two Christian villages of Pageh. The system of religious festivals with their attendant idleness prevents the cultivation of this cereal. The villages that have turned Christian are said to have done so for the purpose of being able to cultivate rice.

The Mentawei people believe in nature spirits, souls, and ghosts. The chief nature spirits are those in the sky (*tai-ka-manua*), those in the sea (*tai-ka-baga-koat*), those in the jungle (*tai-ka-leleu*), and those in the earth (*tai-ka-baga-polak*). The translations are literal. The spirits are not given individual names, nor are there higher gods, as elsewhere in Indonesia. There is however a special earthquake god called *Teteu*, or grandfather. It is because of this god that the human sacrifice was formerly made at the time of building an *uma*. It is also because of this god that there is in Mentawei a taboo (*takeikei*) against the spilling of blood within the village.[4]

[4] One exception to this rule is made. At the time of building an *uma*, blood is spilled on the ground to summon *Teteu* up to witness the dancing.

Besides these spirits, the Mentawei people believe in two river spirits, *Ina Oinan* (mother of rivers, or water) and *Kameinan*, or, in translation, father's sister. The first of these spirits is propitious towards the people, if properly sacrificed to, and providing the people have committed no ritual sin. It is probably due to this spirit that the people have the custom of bathing their children all day in the water of the rivers while the children are young. The custom is said to be due to the need of acquainting the young with the water spirits, so that they will not stumble in the rivers. The second spirit, *Kameinan*, is always spoken of as being evil.

The Mentawei religion, in common with other Indonesian religions, hinges on the soul concept. The main purpose of the cult in Mentawei is to obtain health and long life. Disease is thought to be due to the temporary absence of the soul, death to the permanent soul-loss. The soul that leaves the body in dreams and sickness is called the *si-magere*. The soul that leaves at death is called the *ketsat*. It is this latter soul which turns into the ghost, *sanitu*. Ghosts are always the bringers of disease, and are invariably malevolent. Ghosts are never prayed to, except for the purpose of witchcraft, nor do they receive sacrifices except for the aforesaid reason. Avoidance is practised towards the ghosts, for they alone are primarily responsible for the luring away of people's souls. In order to prevent this, *kera* or fetish sticks are erected at all of the possible entrances to the village. These sticks prevent the approach of the ghosts, as long as the people have committed no ritual sin, have broken no taboo.

This leads to the necessity of another explanation. Not only have all people souls, but all animals and plants also have souls. Thus, when a pig is sacrificed, the liver is placed on the altar for the protecting spirits of the *uma*. But it is not the liver itself that the spirits are supposed to eat, but rather the soul (*ketsat*) of the pig, and this *ketsat* resides in the liver. In one account of a pig sacrifice it is recorded that "the *ketsat* of the pig went squealing up to the skies" as a sacrifice to the heaven spirits. There is still another animating factor in back of all things, both of the animate, and of those, which to us, are inanimate. These are the spirits

(*kina*). All objects have *kina*. Therefore it is not the fetish sticks (*kera*) themselves which keep the ghosts from the village, but it is the spirits (*kina*) of the sticks which perform the office. For this purpose the people give the fetish sticks thorns, spears, and daggers. The people also must sacrifice to the fetish sticks, or rather to the *kina* of the sticks. Since everything in existence has *kina*, everything is considered anthropomorphic. Thus the *uma*, the houses, boats, bamboos, etc., speak, are spoken to, and act as human beings. One of the most important taboos in Mentawei is directed against the cutting of boats and work tools. The *kina* of these articles would object. Finally it may be suggested that the *kina*, or spirits, are more fundamental than the souls of living beings. For while souls are found only in living beings, spirits (*kina*) are found in all objects. Even souls, *si-magere*, must have spirits, *kina*, to animate them! Thus the first line of an invocation made by the priest (*rimata*) at the founding of a new *uma* reads, "Konan kina-si-magere-mai tatoga-ku." "Come, spirits of the souls of our children."

Necessarily the shaman (*sikerei*) is the most important man of the community. For since the object of Mentawei religion is the avoidance of sickness, the major portion of the cult falls into the hands of the shaman. Moreover, it is the shaman alone who has "seeing eyes and hearing ears," that is, it is he (or she) who can see and hold conversation with the spirits of the altar, and thus diagnose disease. Moreover, the ghosts are visible to his eyes alone, when they enter the village, bringing death and disease. Finally, it is the shaman who accuses people of witchcraft. This gives him the power of removing persons obnoxious to him.

The shaman of Mentawei is not of the "inspired" type, as among the Batak. That is to say, neither spirits nor ghosts enter his body or speak through his lips. While he holds conversation with, and is in special rapport with, the invisible and spirit world, still this world remains outside of his own person. If, then, the word "shaman" be used in its Siberian connotation, it would be better to label the Mentawei *sikerei* as a "seer." Culturally the seer type of medicine-man is older than the true shaman or inspired type, for it is the seer that is to be found among the more

primitive, or more isolated peoples, such as the Australians, the Andaman islanders, and most, if not all, of the American Indians. The seer usually obtains his position and power through acquiring a vision, and the Mentawei *sikerei* must obtain a vision in order to have his "seeing eyes and hearing ears." This vision is sought for after the youth is warned by sickness. If the youth disobeyed the warning he would die.[5]

The religious festival of the Mentawei people is called *lia* or *punen*. The *lia* is a family festival, is of shorter duration, and is attended by the sacrifice of chickens. The *punen* is the celebration attended by all of the members of the *uma*, men, women, and children. It is of longer duration, lasting sometimes for years, and both pigs and chickens are sacrificed. The house father (*ukui*) conducts the *lia*, the priest (*rimata*) conducts the *punen*, aided by one or more seers. According to Hansen, the Mentawei islanders are in a state of *punen*, with its attendant taboos (*takeikei*), for about ten months in the year.[6] The Mentawei

[5] Among the Plains Indians every man is supposed to obtain a vision, and hence all would, according to my definition, be seers. This of course is not true. The probabilities are that this aspect of Plains culture arose from the vision quest of seers proper. Among other Indians, as the California Pomo, certain medicine-men are not seers, but practise by virtue of inherited magical outfits. Yet these men are in better rapport with the spirit world than the layman.

This distinction between the shaman and the seer has been, to a certain extent, anticipated by Boas ("America and the Old World." Congrès International des Américanistes, Göteborg, 27, 1925), who writes: "The belief in obsession is a most characteristic form of belief in the Old World—where it occurs practically everywhere. On the other hand it seems quite foreign to the beliefs of American tribes. Ideas of personal contact between man and supernatural beings are quite frequent, but obsession and with it the various forms of exorcism do not seem to occur. The spirits may attack man, but they do not enter his body." I have made use of the term possession, and not obsession. Furthermore, I have not classified the difference between the two types of medicine-man as belonging to the New and Old World, respectively, but rather as belonging to an archaic and a more recent culture stratum. Possession does not occur practically everywhere in the Old World. Even in Indonesia itself it is lacking in the islands west of Sumatra, in Borneo, and no doubt elsewhere. On the other hand, it is not certain that possession is not to be found among the tribes of the Northwest in America. The reason why I must differ in opinion with Boas lies perhaps in the fact that he has only taken one attribute of the "possession concept," that of the disease factor.

[6] J. F. K. Hansen, De Groep Noord en Zuid Pageh van de Mentawei-Eilanden. Bijdragen tot de Taal, Land en Volkenkunde van Nederlandsch-Indie, 174, 1915.

concept of *punen* and its attendant ideas is known elsewhere in the cultural region of southeast Asia. Thus the Bontok Igorot have their rest days.[7] More strikingly similar, however, are the *pena* and attendant *gena* (taboos) of the Angami Naga of Assam. During these periods the unit of the village holding the festival is rendered isolated and all work in the fields forbidden.[8] It is therefore only the severity of the Mentawei *punen* system, and the extent to which it has influenced all of the institutions of the people, which make it exceptional.

Among the occasions on which *punen* are held may be included: the building of a new communal house (*uma*), the choice of a new priest, the making of a new field, the spilling of blood within the village, an epidemic in the village, when a tree falls in the community, and after the killing of a sacrificial animal, monkey, deer or sea-turtle. The duration of a *punen* at the time of the founding of a new *uma* or at the election of a new priest is so long (lasting at least nine years) that these two events are usually held simultaneously. If a priest dies, his successor is not chosen until a new *uma* is erected, and some married man fills the position temporarily. Family or personal *punen*, that is *lia*, are held at the time of sickness in the household, marriage, adoption of children, the making of a boat or family field, etc. It may be said that all children have to be adopted, but this is done in the family itself. In case the father is married to the mother, he will adopt the children. Otherwise the father or mother's brother of the woman will adopt the children. The ceremony, with all of its taboos, lasts nine months. Adoption is necessary in order to give the child its legal rights in inheritance.

A *punen* is initiated by the ceremonial washing of the hair of the participants, and the adoption of gala decorations. All work in the fields is then stopped, and strangers are denied access to the *uma*. The main ceremonial acts of every *punen* are the slaughter of pigs and chickens, accompanied by the sacrifice of the livers and haruspication. During the invocation accompanying

[7] A. E. Jenks, The Bontoc Igorot. Ethnological Survey Publications, 1: 206. Manila, 1905.

[8] J. H. Hutton, The Angami Nagas, 192, 1921.

every sacrifice, the souls of the people of the *uma* are invoked to return and remain by their owners. During the first nights of the *punen*, dancing takes place by the seers. The dance is for the purpose of pleasing the spirits, and is held in imitation of various birds and animals. During the latter part of the *punen*, hunts for monkeys and deer are made, and the sea-turtle is sought for by placing large nets (*djarik*). During the time of *punen* the men sleep in the *uma*, for all sexual intercourse is taboo. No special ceremony concludes a *punen*, but the men simply resume their fishing on the sea, the women their work in the fields.

At the time of any *punen* of importance, all the work of the people has to be initiated by the priest. Thus, no boats can be built until a first boat is constructed by the priest and his assistants and then consecrated. The same thing is true of the first making of fields, fishing, *djurut* making,[9] hunting, etc. This feature of the *punen* system causes the prolongation of the ceremony, for in case of any bad omen, such as an earthquake or sickness in the village, the work of initiation is delayed. In the family *lia* (small *punen*) accompanying marriage or adoption, various kinds of work have to be initiated and consecrated in much the same fashion. Finally, at the time of the making of a new *uma*, all of the youths who have never been initiated to an *uma* undergo initiation. The initiation of the youths is called *eneget*. This initiation is for the purpose of placing the youths under the protection of the guardian spirits of the *uma*. For each youth taken in, a pig must be sacrificed. Two pigs are sacrificed for each boy, and one pig for each girl. The youths are then given a ceremonial bath, and blown on by the priest. These acts are accompanied by a blessing. Adults who wish to join an *uma* different from their own are forced to give a pig for *punen* before leaving their old *uma*, and another pig upon entering the new *uma*.

Considering the Mentawei *punen* system from a theoretical point of view, it seems probable that the concept arose from the

[9] *Djurut* is an unfermented drink used by the people of Mentawei. It is made from coconut milk and sugar-cane juice.

lia, or family system. That is to say, it was the house father (*ukui*) who alone originally made the sacrifice, and this was done for the blood family, the original unit. Later, with the coming in of the communal house, the families became partially merged in the *uma*, or larger division, and the priest (*rimata*) became the officiating head, or father, of the community. The older *lia*, or family system, has never become lost. Not only is the *lia* alone the prevailing form of ceremony at ordinary family functions, births, adoptions, and mild cases of sickness, but it is also true that for every *punen* feast and sacrifice there must also be a family sacrifice. That is, each house father must carry back a portion of the meat from the communal house, perform a sacrifice, and consume it with his own family, in his own home. At the time of sacrifice, in the communal house, all of the meat is divided equally amongst the house fathers. The meat is not eaten in the communal house (*uma*), but is brought home to the family houses (*lalep*), where another sacrifice is made, and the meat is eaten there.

Another consideration which causes me to assume the priority of the family *lia*, is the prevailing spirit of communism among the members of the village unit (the *uma*). The members of the *uma* are, as it were, an enlarged family, with the *rimata* (priest) as their father. Just as in a family all goods are equally divided among the members, so in the *uma*, during *punen* time, all products of the hunt or fishing expeditions are equally divided, the priest receiving the same share as the others. Contributions for the sacrifice, moreover, when not for the purpose of expiating an individual fault, are equally leveled, and this again tends to create an equality in the ownership of domestic animals. With the exception of certain insignia of office worn by the seers and priest when officiating (including chicken feathers worn by the priest) all clothing must be of the same kind during a *punen* period. During other periods, not much variation is shown in clothing, even at the present day.

It therefore seems probable that the *punen* system originated from a family method of sacrifice. Fastening itself upon a culture originally barren in ceremonial usage, it became extended under

the guidance of the seers,[10] and presently permeated all aspects of Mentawei culture. Death, marriage, puberty, sickness, and the initiation of all methods of work, became mere aspects of *punen* ritual. Government, through a system of fines or ostracism, became a part of *punen* supervision. Communism, inherent in earlier family groupings, became ritually retained during *punen* periods. The *punen* system brings enforced idleness, prolonged abstention from sexual intercourse for longer periods than are known perhaps to any other people on earth, intermittent periods of feast and famine, and an utter inability of the people to absorb foreign elements of culture, such as the rearing of non-sacrificial animals (as cattle), or the cultivation of rice, which requires steady labor. On the other hand, it has lasted because of the insistence of the seers, who play upon the credulity of the people. Likewise, it appeals to the group feelings of the people, keeping them united in a brotherhood of faith, a common ownership of material possessions, and an equality of rank and prestige.[11]

I will now discuss the family itself, that being the smallest unit in Mentawei social organization. In order to avoid the use of circumlocutions I will hereafter use the following native words without translation: *uma*, communal house, division of village; *lalep*, family house; *rusuk*, house without altar; *punen*, religious festival of people of *uma*; *lia*, family religious festival.

Kinship terms.—It must be remarked in the first place, that there is no "Malayan" system of kinship. Morgan very incorrectly assumed the existence of a simple kinship system by generation, which was comparable to the Polynesian, and which extended over the whole of Indonesia.[12] Such a concept could only hold true of the Philippines, Borneo, Celebes, and the Moluccas, where

[10] The seers are the chief profiteers of the *punen*, especially when the sacrifices are given for the purpose of curing. They and the priests do little work beyond the ceremonial. In a written account of shamanism in Mentawei, which I received from two seers, these men claimed that it was because of the spirit communications coming through the seers that the people of Mentawei have so many taboos.

[11] So great is the feeling of equality in Mentawei, that if a man excels in the hunt or fishing, he is liable to be accused of witchcraft and put to death.

[12] L. H. Morgan, Ancient Society, 418.

sib systems are lacking. Sumatra, with the exception of the low nomadic tribes, has either patrilineal or matrilineal sibs. The islands to the west of Sumatra have, in general, sib systems. In Java it seems probable that earlier sib systems have been wiped out by the higher culture of the peoples. In Mentawei itself the kinship terms are such as could be used in a sib system, but no trace of such a system is existent.

Kruyt has already published the Mentawei kinship terminology.[13] I have checked this up, and am giving some additions.

The word *ukui* is used in Pageh for father. It also indicates that a man belongs to the married men's age class. Father's sister's husband and mother's sister's husband are also spoken of as *ukui*. The word *ama* (a more general term for father in Indonesian) is used in Siberut. In Pageh the word *ama* is only used in compounds indicating father, as *togat si-ama-et*, a child who has a human father, or a human being. *Ina* is the common word for mother throughout the Mentawei islands. Father's brother's wife is also called *ina*. A man calls his father's sister *ina* in address. *Ta-ina*, not mother, is used in address for son or daughter.

Uncles are differentiated from father and from each other. *Badja* is the term for father's brother. This term is also applied to any old man or woman, the root being old. Thus, *pu-babadja*, to live to an old age. The paternal uncle, however, is not fully differentiated from the father, for both *ukui* and *ama* are used in terms of address. Mother's brother is *kamaman*, and the reciprocal used in address is *ta-kamaman*. Father's sister is called *kameinan* and mother's sister *kalabai*. According to Kruyt, mother's brother and mother's sister are addressed also by their sister's children as *ukui* and *ina*. A specially close relationship exists only between a boy and his *kamaman*. A man calls his nephews or nieces through his sister *bua*. The verb form of the word *bua*, *bua-ake*, means to bear fruit. A child can speak of his grandparents as *si-bubuakat*. The nephews and nieces through a man's brother are called *momoi*. A woman reverses the words *bua*

[13] Alb. C. Kruyt, De Mentawaiers. Tijdschrift voor Indische Taal, Land en Volkenkunde, 2 ff, 1923.

and *momoi*, depending on whether the children are through a brother or sister.

A man calls his brother, and a woman calls her sister, *alei*. This same term can be used for a parallel cousin of the same sex, thus a father's brother's child, or a mother's sister's child. The same word is used for friend. *Sara-ina*, one mother, is a more common name for brother or sister, and is also used as a term for friend. This term is used very broadly, even in addressing animals. Any person who can neither be addressed as a relative nor as a friend (personal names are not used in address) is considered a stranger (*sa-sareu*, one from a distance) and is an actual or potential enemy. A brother speaks of his sister, or a sister of her brother, as *maniu*. But a man speaks of his brother, or a woman of her sister, as *si-lat* (meaning the other side of the body). In address the age of the sibling is considered when a man speaks to his brother or a woman to her sister: thus, elder sibling is *kebu*; and younger, *bagi*. The word *kebu* used in compound means elders, or ancestors, *tai-kebu-kat*. When two people are married, they are spoken of as *pu-kebu-kat*, *pu* being a verbal prefix. In Si Pora the word for brother is *saraket*, but in Pageh this term is only used when speaking of a dead brother.

The information which I received concerning cousins differs from that printed by Kruyt. Kruyt writes:

> The children of my father's or of my mother's brother are my *patogan ama*; those of my father's or mother's sister, *patogan ina*. The children of a brother and of a sister are to each other *taluba*.

According to the information which I received from the natives' a village census of ten marriages in Matobe (Pageh), and information derived from Herr Börger, the children of two brothers are called *pa-togat-ama*. They call each other brother and sister, and are not supposed to marry. The children of two sisters are called *pa-togat-ina*. They do not call each other brother and sister, but seldom marry. The children of a brother and a sister do not call each other brother and sister. They seldom marry. It will be observed that my spelling of the first two terms differs from that of Kruyt. While the orthography of Kruyt defies translation, the first two terms as given to me mean the children of a father

and his brother, and the children of a mother and her sister. In the ten marriages recorded at Matobe, one was between cross-cousins, the children of a brother and sister. In another marriage the two fathers were *pa-togat-ama*, and the man and wife called each other brother and sister.

Children and youths are classified according to age. They are not usually spoken of, or addressed, by name. A child in general is spoken of as *toga*. Then there are a number of terms for little boys and girls used in address. Boys may be called *si-rou*, *puisu*, *si-rue*, etc. Girls may be called *si-djidji*, when under one year of age, when older *si-oiso*, *rogai*, *loiboi*, etc. An unmarried man is spoken of as *si-lainge*, *lainge* meaning a beautiful body. An unmarried woman is spoken of as *si-oko*. A married man is called *ukui*, or father. A married woman *si-ka-lalep*, the one in the house. In Pageh a man and woman will live together for some time, and may have children, before marriage. A man will speak of the woman he is keeping in this way as his *mandri*, and the man is spoken of by the woman as *mandri*. From secondary usage the term means relatives in general, especially husband or wife. After the death of a near relative, one again changes one's age status. A child without elders is addressed as *lulusai*. A widow or widower is called *si-lumang*. The word *teteu* however is the more common for a widow or widower, both in reference and in address. When the man marries again, his children call him *ukui*. A grandfather or grandmother is also called *teteu*, although, according to Kruyt, he or she may be addressed by the children as father or mother. The child speaks of his grandparents as *si-bubua*. A person speaks of his grandchildren as *punu teteu*, *punu* meaning "in place of." In address the children are called *ta-teteu* by the grandparents. Finally any bereaved person is spoken of as *pailot*, although, more specifically, this means a man who has lost a brother or wife. A person who has lost all of his or her children is called *si-botok*.

Taking up next relatives by affinity, we find that parents-in-law are called *tali-ku* (my thread). Son-in-law or daughter-in-law are also called *tali-ku*. The brother of a man's wife, or the husband of a man's sister is his *lakut*. The brother or sister of a woman's

husband is his *eira*. The wife of a man's brother is also his *eira*. The husbands of two sisters call each other *sa-ulu*. The words *sa-ulu* and *sa-eira* are also used for a blood related family. The word *epu* can mean either parents, or relatives in general. The inmates of a household are referred to as *sanga lalep*, one household.

The kinship system as outlined above stresses age classes. Not only is a distinction made between children, youths above puberty, and married people, but a further distinction is made in cases of bereaved persons. These distinctions are rendered necessary by religious custom. Married men are under many more taboos than single men. When a man becomes a widower, he is no longer an *ukui* and hence must receive a change of relationship term. The need for this change is clearly indicated in the case of seer or priest, since these men cannot even practise their office if unmarried.

It has been shown that a distinction is made between the mother's relatives and the father's relatives. The mother's brother, *kamaman*, is especially close, in Pageh, to his nephews. In the stories it is always the maternal uncle and not the father who is the natural companion of the boys. A maternal uncle must also allow his nephews and nieces the right to gather the products of his fields, along with his own brothers and children. The paternal uncle is not sharply differentiated from the father, since they are both addressed in the same manner. Cross-cousins are allowed to marry each other, but there is no compulsion. According to Kruyt, children of the same mother but of different fathers are allowed to marry, provided they come from different families. This would show that descent is counted primarily in the male line.

Personal names.—Personal names are changed frequently in Mentawei, as in Polynesia. If a person dies, the survivors of the same name must change their names. When a person becomes bereaved by the loss of a near relative, he or she goes into mourning. While the bereaved person is in mourning he loses his name, being called *teteu*, or some similar title. During the period of mourning the bereaved person must lay aside all ornament, and abstain from attending *punen*. The ghost of the dead is believed

to render the bereaved person unclean. At the end of the period of mourning the bereaved person is ceremonially washed, a *lia* is held, and the person assumes a new name. A man or woman who loses a spouse mourns until he or she marries again. In case there is no remarriage the person retains the title *teteu*. A man or woman who becomes a seer assumes a new name. He will however frequently change this name.

A child is given its first name before its fourth month. Either the father or the mother gives the name. A nickname may also be given. A person's family cannot be inferred from his name, although these may be ancestral. The name of a forefather or grandfather is frequently assumed, provided the member of the elder generation is already dead. A person who is about to die will change his name, so as not to carry it down into the grave with him. The name which a dead person bore can never be used or uttered again. To do this is a curse, since the name is ghost-contaminated. In former days it would have occasioned a fight. To further illustrate the close connection between ghosts and names, the case may be mentioned, as given by Kruyt, in which the elders not only change their names at the death of a child, but also in the event that subsequently a brother or sister of the dead child becomes sick. A seer then comes in and gives the elders new names. The only cause of sickness and death in Mentawei (outside of visible natural causes and some forms of witchcraft) is soul-abstraction by ghosts. Hence name-changing in Mentawei is fundamentally a form of ghost avoidance.

It is difficult to tell sex by the Mentawei names. Women however are more apt to be named after flowers. A short list of names is here given, as collected by Börger in Pageh. No guarantee can be presented that the names are not nicknames. The Mentawei people are reserved about giving their names, since these can be used in witchcraft.

Names of men

Si Ngena-katiri	He who waits on the upper river.
Si Sara-mata	The one-eyed.
Si Soibo-mei	He who goes in the evening.
Si Gaba-bulau	He who looks for money.
Si Sarat-mulaibo	He who is always speaking.

Si Tuitui-ake-ina	He who chases away his mother.
Si Ta-maila	He who is not ashamed of himself.
Si Gaba-punen	He who looks for *punen* (long life).
Si Telu-malainge	He who is three times beautiful.
Si Maletuak	A variety of bat.
Si Mairank	A variety of fish.
Si Manjang	An eagle.

Names of women

Si Ta-anai-si-ake-nia	She who has no one there to give her anything.
Si Ogo	The flower.
Si Itjo-tubunia	She who looks at her own body.
Si Oba-osa	She who wishes to be diligent.
Si Sarat-sinogai	She only is called.

It may finally be remarked that no record is kept of the deeds of ancestors nor of their names. Hence it is impossible to collect genealogies or historic traditions. All the Mentawei stories have nameless heroes. Either the hero is simply called a man, *simanteu*, or else the name is descriptive of an achievement, as Segemulaibi, "he who climbed up on a rattan."

Marriage.—While marriage is still by purchase in Siberut, in Pageh the custom is not practised, or rather is said to have fallen into disuse. In one village of North Pageh, Saumangania, bride-purchase is practised. The name for the bride-price is *patalagaat*, that which is placed in the middle. Of course, with the payment of a bride-price the peculiar feature of Mentawei marriage, the preliminary living together of the couple in a *rusuk*, is absent. While all the writers on Pageh are in agreement that the bride-price is the older of the two customs, and this seems the general opinion of the natives themselves, yet in my mind there is considerable room for doubt. No mention is made of bride-purchase in Mentawei stories. Further, the idea of rigid bride-purchase seems somewhat alien to Mentawei, where both a strong patrilineal power is lacking, and the idea of purchase does not enter into other fields of social or economic life. Besides, in Siberut, the bride-purchase, according to Kruyt, is enacted in extreme form. If the husband dies before the price is completely paid, his brothers assume the debt. Now in Nias a rigid patriarchal power is coupled with bride-purchase, and it may well be assumed that the latter

cultural feature was diffused to the north of the Mentawei islands, that is, Siberut.

Marriage in Pageh is matrilocal as to village. In the ten marriages reported from Matobe, eight took place in the same village, and two men married into the village. The general rule is that women do not leave their village to marry, for if they did so they would lose possession of their taro fields. It very often happens that men marry the women for their fields. Now in patriarchal societies, such as the Batak or Nias, marriage is patrilocal and inheritance patrilineal. Matrilocal residence and rigid bride-purchase cannot consistently be coupled together, and I know of no society where they are found in common. There is no evidence in Pageh that men formerly owned the taro fields, or that marriage was originally patrilocal.

Taking up now the regular mode of Mentawei marriage, we find that this can be divided into two periods. In the first period the man and woman sleep together, but are not allowed to eat together. For want of a better designation, I will call this period betrothal. In the second period, after a marriage *lia* has been performed, the couple sleep and eat together. The husband then becomes an *ukui* or house father. While the couple are still betrothed they must sleep together in a *rusuk*, since the man cannot visit his mistress at the home of her parents. Any children which are born are adopted (*pipi*) by the father of the woman, or if the father is not available, by the woman's maternal uncle. When the couple prepare to marry, the man must first lay out a banana field, and build a *lalep* (house) with the aid of his wife's family. Then after marriage, the children are readopted by the parents.

Girls are often engaged when quite young. This is called *turu-ake-nen*. The man goes to the mother and obtains her promise for the girl. No present is given, however, at this time. When the girl is older, the man actually becomes engaged (*sere*) to her. He then gives some beads, cloth, and armbands to the mother. If the mother accepts, she sends her daughter the next day to meet the boy in his field hut. Even if the mother does not accept, the girl is liable to go anyway. Both of these forms of engagements are

considered binding, and the mother is supposed thereafter to keep other men from her daughter. The first form occurs only if the daughter is very young.

Either girls or men may be the owners of *rusuk*. It is in these forms of houses that the betrothed pair cook and sleep. They eat, however, in the homes of their parents. Young men may visit each other in the *rusuk*, provided they do it openly. Actually, as far as adultery is concerned, the engaged pair are as good as married. A man may desert his betrothed and take another girl. This however is very much looked down upon by the people.

While a man is living with his betrothed in *rusuk*, he is supposed to do some work for the girl's parents in their field. He is also supposed to keep the girl supplied with cloth, baskets, and ornaments. According to Börger, while the man is in *rusuk*, he must avoid the father and mother of his bride. That is, he must not speak to them. The girl must avoid the mother of the man, but not the father. After marriage there are no restrictions of this nature. While marriage itself in Mentawei is strictly monogamous, yet during the *rusuk* period a man may have intercourse with all the sisters in a family. The keeping of a woman in a *rusuk* is not altogether an open affair. The man and the woman never enter together. Usually the woman goes in first, and then sometime after the man follows.

The reason for the prolonged period of betrothal before marriage lies in the many taboos to which married men are subjected. They are not allowed to kill pigs or chickens, fell trees, ram in the earth for planting poles, to eat squirrels, coconut rats, etc. If they break any of the taboos the children would become sick.

The most common reason for marriage as given in Matobe was that the elders of the woman either died or left the village. Then there remained no one to look after the children. The next most important reason was the desire of the man to gain possession of the fields of the woman. In two cases the reason given by the man for marriage was his desire to become a seer. As already pointed out, a seer must be a married man.

It is usually the woman who desires a marriage to take place. She does not however tell the man directly, as she would be

ashamed to do this. If however she already has two or three children, she may say to her friends, "I have so much trouble, it is almost as if my children have no father." Then the man is told that he must marry the woman. According to the census taken at Matobe, one third of the total number of children were born out of wedlock.

When it is decided that the young pair will marry, and after the groom has the necessary house, domestic animals, baskets, etc., to render marital life economically feasible, a group of the relatives of the man, under the leadership of the father of the groom or the paternal uncle, go to the dwelling of the girl. Here a stereotyped conversation follows. The father of the man asks for the girl for his son, and the father of the girl accepts, depreciating, however, the marriageable qualities of his daughter.

Then a date is set, and in preparation for the marriage *lia*, wood, food, and grated sago as chicken food are prepared. After this the people ceremonially wash their hair (*magiri*). A preliminary visit which is held at the house (*lalep*) of the girl takes place in the evening. The next morning the actual ceremony takes place at the house of the brother of the groom, who performs the ceremony. The wife of this man brings in the bride.

The central feature of the Mentawei marriage is the eating together of groom and bride. Heretofore the couple had never eaten together. After this ceremony the pair must always eat together in their *lalep*. For a man or wife to eat separately would be a sin; this sin has a special name, *masoilo*, and arouses the anger of the spirits of the altar. The exact manner in which the bride and groom partake of their first food in common, is for the officiating brother to divide a cooked white chicken egg in half, giving one portion to the groom and one to the bride. After the egg is eaten, a general feast follows. The name of the egg used in the marriage ceremony is *pasailiat kabei*, "to change the house hand."

After this marriage meal the men and women go separately to bathe in the river. On their way back they gather sacred flowers for the altar (*buluat*). Then the old flowers (*katsaila*) are removed from the house altar and scattered over the house, the new flowers being put in their place. Next the people oil their bodies, and make

them yellow with powdered curry berry, as decoration for the *lia*. The officiating brother then sacrifices eggs and yam (*laikei*) to the spirits of the altar, accompanied by suitable invocation. Next he takes a white chicken and passes it over the heads of the married couple. This is called *lia-ake*, to make *lia*. The invocation spoken is as follows,

Akoi lia mai gougou , sisasa tubu-nia
Here is our lia a chicken that can fly up by itself,
Siagai pato manua. Aili-ake-nen mai samanku samba tatoga.
that knows the morning. So may my wife and children be.

In other words, the wife and children should be like the chicken. For the chicken flies straight, knows when it is morning, and is, in general, a wise bird. After the invocation the chicken is killed, sprinkled with water, singed, and the liver inspected for omen taking.[14]

The remainder of the *lia* is performed by the married couple, aided by the brother. The affair lasts for a month or two. Every kind of food used must be obtained, and sacrificed at the altar of the new house. Remnants from the new fields, boats, and new work tools must also be consecrated by being sprinkled with water in the *uma*. Special foods that must be caught and sacrificed are shrimps and crabs. The idea is that these give the young couple long life, due to their habit of changing their skins. The bouquet of flowers before the altar must also be changed in the new home, since these sacred plants are supposed to contain the souls of the dwellers of the *lalep*. Finally, the woman must be taken into the *uma* of the man, if the marriage takes place in the same village, or the man taken into the *uma* of the woman, if he be a stranger to the village. This involves a short *punen* period, and the killing of a pig.

Pregnancy and child-birth.[15]—When a woman becomes pregnant she is relieved of all heavy work. She is also subjected to a number of taboos. She cannot go near a dead animal, for fear of killing

[14] The Mentawei islanders are not allowed to let blood drip on the ground. So chickens are killed by wringing their necks and pigs by spearing, so that they bleed to death internally.

[15] The information given by Kruyt, op. cit., 41, is complete and reliable on these topics, and I am here giving a summary of his investigation.

the foetus. She cannot sit or run in the sunshine, or sit with her back to the fire. She cannot tie knots, plant taro, or wash sago. Certain foods are also forbidden to the woman. No trace of the couvade appears, nor is the married man placed under many new restrictions at this time. He must not however go hunting.

While the woman is pregnant her husband must abstain from sexual intercourse with her, nor can he again approach her until some time after the birth of the child. While the woman is pregnant she is only allowed to come into contact with married men. Even her own brothers, if they be unmarried, are not allowed access to the house.

There are no midwives in Mentawei, but a number of women aid at the time of a birth. They support the woman, who gives birth to the child in a sitting position. When the event does not go off smoothly, everything in the house is opened, and all knots are untied. If in spite of these measures the child is late in arrival, the people say that it is because the woman has broken a *punen* taboo. Then, if the condition of the woman continues to be serious, a seer is summoned. Sacrifices are made, a half going to the seer as his payment, and a cure affected in the usual manner. The seer brings with him his bells, a basin of water, and plants with life-giving qualities. The seer tinkles his bells, sings incantations, and urges his guardian spirits, perhaps the wood spirits (*tai-ka-leleu*), to descend into the water. The plants are mashed up and put into the water, and the woman is then made to drink some of it, the remainder being poured over her as a bath. Finally the soul of the woman is invoked to return, and the cure is at an end.

After the child is born the navel string is cut with a knife by the women. The placenta is covered with ashes, placed in a bamboo cooker, and preserved above the fireplace. Children born dead, *si-laelae*, are cast out into the wilderness. If the mother dies in childbirth, the child is strangled and buried with her. Otherwise the mother would come back looking for the child. The ghost of such a mother is considered more dangerous than other ghosts, but the body is disposed of in the usual manner, being either deposited on a platform or buried. In Nias, when a mother gives birth to twins, the pair are usually killed, but in

Mentawei the lives of both are spared. No great harm is thought to have been done. Some people think, however, in the case of girl and boy twins, that the pair will not live long, because they have come into too close contact with each other in the womb.

The day after the birth of the child, the mother brings the suckling to the river, and remains squatting in the water the entire day with the child in her arms. She only goes home to eat. She does this for three months, except when it rains. Until the child is old enough to begin learning to walk, it is never allowed to touch the ground. The word used for caring for children is *uka*, which also means to hold. Either the father or mother must be in constant attendance on young children, holding them in their arms.

The adoption of the child.—After the birth of a child, the mother can resume work as soon as her condition allows. The person who adopts the child, however, must observe *lia* for at least ten months. If the couple are married, it is the father who adopts (*pipi*) the child, otherwise the father of the woman. The delay caused by the adoption *lia* furnishes another argument against early marriage in Pageh.

One or two days after the child is born, the first *lia* takes place. This is called *lia kabe-bela*, "*lia* for the hand coming out." Chickens are killed in sacrifice, and the child is given its first talisman (*ngalou*). The father obtains wood, and cuts it as small as matches. These are wrapped in red calico, and hung around the neck of the child.

After this the father has to initiate all kinds of his work in the usual ceremonial manner. For one month the father must only fish, the next hunt, then make tapa, then start in work on his fields, finally either build a boat or make sago. Three months are spent in preparing the decorations for the child, its brass wrist bands, arm bands, and tail of leaves. The brass ornaments are, of course, imported, but the time is spent in consecrating the ornaments. At the time of attaching the final ornament to the child, the leaf tail, a special *lia* is held, *lia koirit alai*, "The *lia* for the putting away of the hair." At the beginning of this *lia*, the hair of the child is cut, especially around the neck and behind the

ears. This hair is then wrapped in a leaf of the sacred plant *bobolo* (*Dracaena*) and placed in a bamboo cooker. In this cooker the hair of all the children of the family is kept and the cooker is inherited in the family. After this *lia* the hair on the crown of the head can never be cut, for fear of losing the soul.

When the child is five months of age it receives its second talisman, *ngalou panake*, the shutting talisman. From then on it can eat all kinds of food without injury to itself. The talisman is called "shutting," because it is supposed to close in the soul to the body of the child. At this time the child is also given further decorations, including strings of glass beads, and the hair of its head again cut. In order to strengthen the power of the second talisman, two monkeys have to be obtained. The first monkey killed is called *loket*, or to entice. The skull of this monkey is hung up in the *uma* as usual. This skull, as well as all other deer and monkey skulls in the *uma*, are supposed to lure the wild animals of the jungle, so that they can readily be caught. At time of *punen*, the souls of the wild animals are summoned. They then come up a special ladder, the spirit ladder, and enter the *uma*. The second monkey shot is called *seukatnia*, the cooked one. The cooked flesh of this monkey is rubbed on the child, "in order to warm the talisman." Finally after the child has been taken to the field, and a *lia* held there, and after all forms of work have been properly initiated, the *lia* for adoption is at an end. The ordinary time for this *lia* is ten months, but if the child is taken sick in the meantime, the affair will last longer. During the course of the *lia* the man holding it, and his wife, are unable to have sexual intercourse, or to attend to their ordinary work. As a result, their fields run to weeds. Still, the proper form of *lia* is held to be a necessity, for without it the child is not regarded as legitimate, and cannot inherit.

It may be said of Mentawei ritual in general, and this statement would hold for all primitive or isolated peoples, that the elaborateness of their ceremonial system gained its chance for development due to lack of economic competition and absence of alien mental outlook. Once tobacco, cloth, and oil for lamps were introduced, the natives of Mentawei had other aims to strive for,

other work to perform, than that merely prescribed by their religious system. With alien goods necessarily came alien and critical ideas. The Mentawei *punen* is no longer the same, either in length or in strictness of observance, as that of former days. The natives themselves are well aware of this fact, and regard the past as the Golden Age, when *punen* were real *punen*, and the amount of sacrifices furnished mighty feasts to the spirits.

Married life.—Since every married man becomes an *ukui*, or house priest, married life in Mentawei is in itself somewhat of a sacrament. Hence it is not surprising to find that divorce is either absent, or at least very rare. I heard of only one case of divorce in Pageh, and that was occasioned by the husband's turning Christian. The altar was desecrated, the man placed outside of the *uma*, and the wife considered that she had no choice but that of taking her children and fleeing. Naturally the felicity of married life is no greater in Pageh than elsewhere, and wives, when displeased, are apt to run away; husbands, to avoid their spouses. In the history of ten marriages in Matobe, three of the wives had on occasion run away from their husbands. One of the wives ran away five times, another three times. The second wife stayed away for a period of five months on one occasion. In the case of a wife's running away at her own will, it is not in accordance with custom for the husband to seek her return. She must do this of her own accord.

Adultery is said to have been formerly punished by death, now by the confiscation of property by the family of the wronged party. I heard of no certain cases of adultery in Matobe. One woman was said to have committed the sin with her grown-up stepson. But this was mere gossip. Adultery certainly was very rare.

One finds that in Mentawei the same good qualities are respected in both men and women, the same bad qualities despised. A popular Mentaweian is one who obeys the *punen* rules, is sociable, a good worker, generous to members of the *uma* and to relatives, good-tempered and jovial. People who steal, change boundaries, indulge in witchcraft, or are greedy, are held in disfavor.

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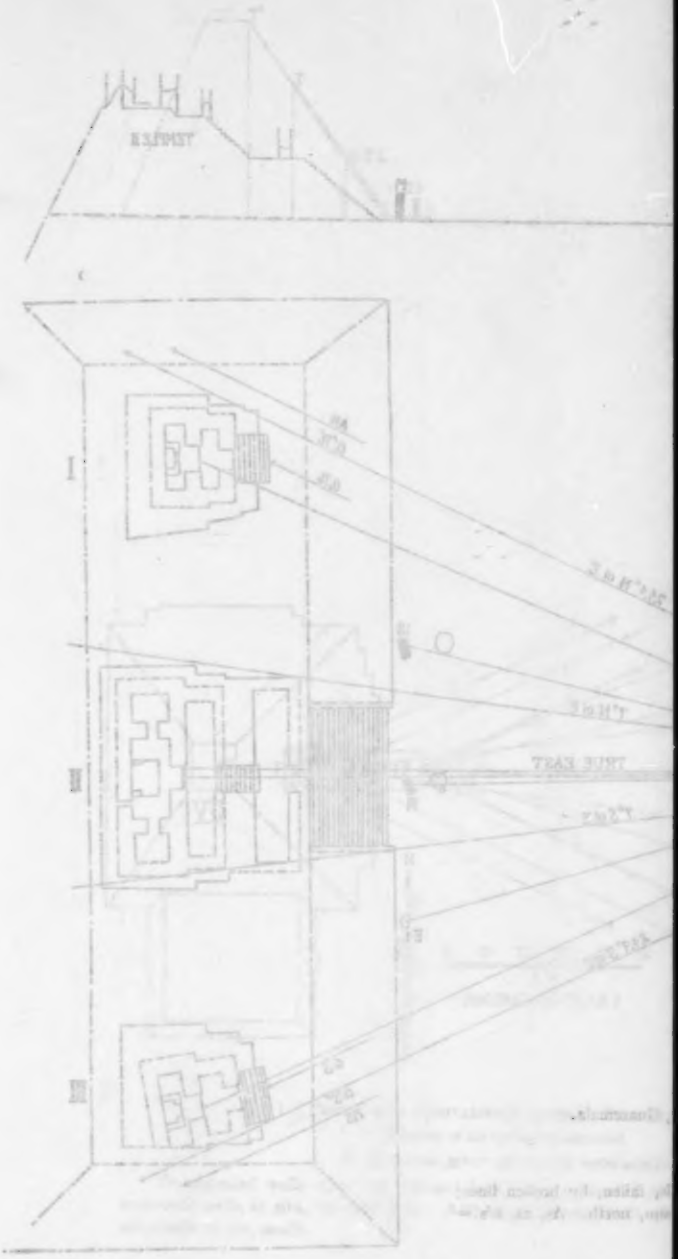
NOTES ON TWO MAYA ASTRONOMIC OBSERVATORIES

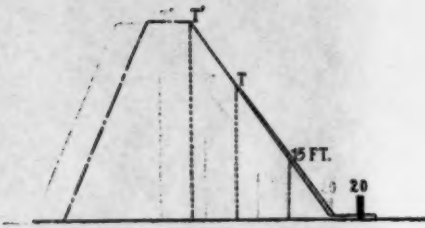
By OLIVER RICKETSON, Jr.

THE archaeological investigations which the Carnegie Institution of Washington has been carrying out for some years in the Maya area have resulted in an increased understanding of the actual astronomical knowledge developed by the Maya previous to any contact with Europeans. As is well known, their perfection of an accurate and complicated calendric system is an achievement unique among the indigenous races of America. The origin of this system is still shrouded in conjecture, but in two instances it has been found that the Maya erected buildings or markers, the construction and location of which can not be attributed to any purpose other than the intentional recording of accurate astronomic data.

The foundations for the study of these data were first laid by the suggestion of Dr. S. G. Morley that the Department of Terrestrial Magnetism of the Carnegie Institution of Washington cooperate with the Middle American Research expeditions in locating the exact geographic positions of certain ruins in the Peten district of Guatemala—the heart of the so-called "Old Empire" of the Maya. As a result, an expedition composed of the writer and Mr. Witherow A. Love was sent out in 1923. Eleven important Maya ruins were visited, and their geographic positions determined as follows:

	Lat. N.	*Long. W.*	*Altitude above sea level (ft.)*	*Variation*
Tayasál	16°56.4′	89°53.8′	497	7°01.5′E.
Itzimté	16°56.0′	90°11.4′		7°06.6′E.
Ixlú	16°58.6′	89°41.7′	497	
Tikál	17°13.3′	89°38.5′	922	
Uolantun	17°10.8′	89°36.8′		
Uaxactun	17°23.8′	89°38.4′	675	7°00′E.
Nakum	17°10.3′	89°26.3′	703	
Naranjo	17°07.4′	89° 5.7′	896	
Ucanal	16°58.8′	89°21.8′	647	6°57.4′E.
Xmakabatun	17°31.2′	89°14.2′	915	6°55.2′E.
Xultun	17°30.5′	89°24.5′	844	
El Cayo	17°10.2′	89°04.1′	286	6°47.1′E.
(town)				6°55.0′E.





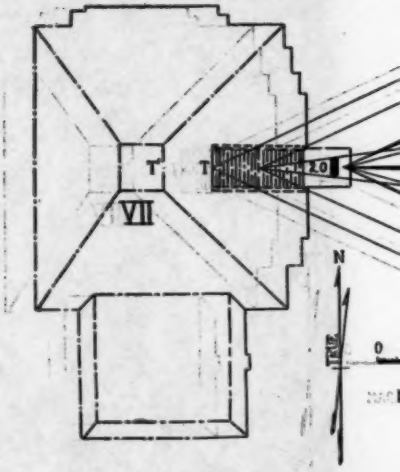
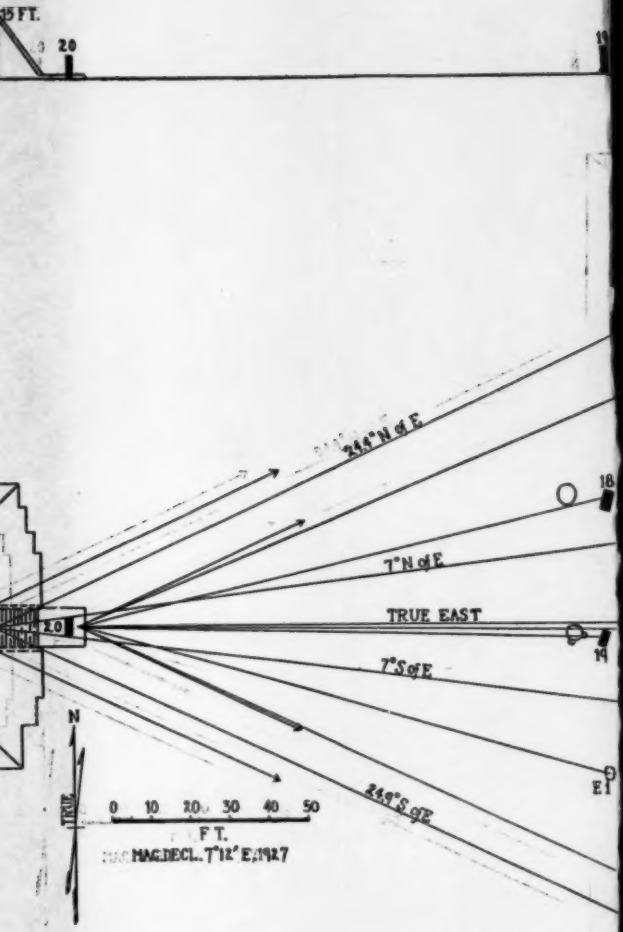


Fig. 1. Plan of solar observa

(Courtesy of

All directions gi

Unexcavated walls shown by dot-and-
excavated walls, in situ, by solid lines. Al
amplitude of sun, south.

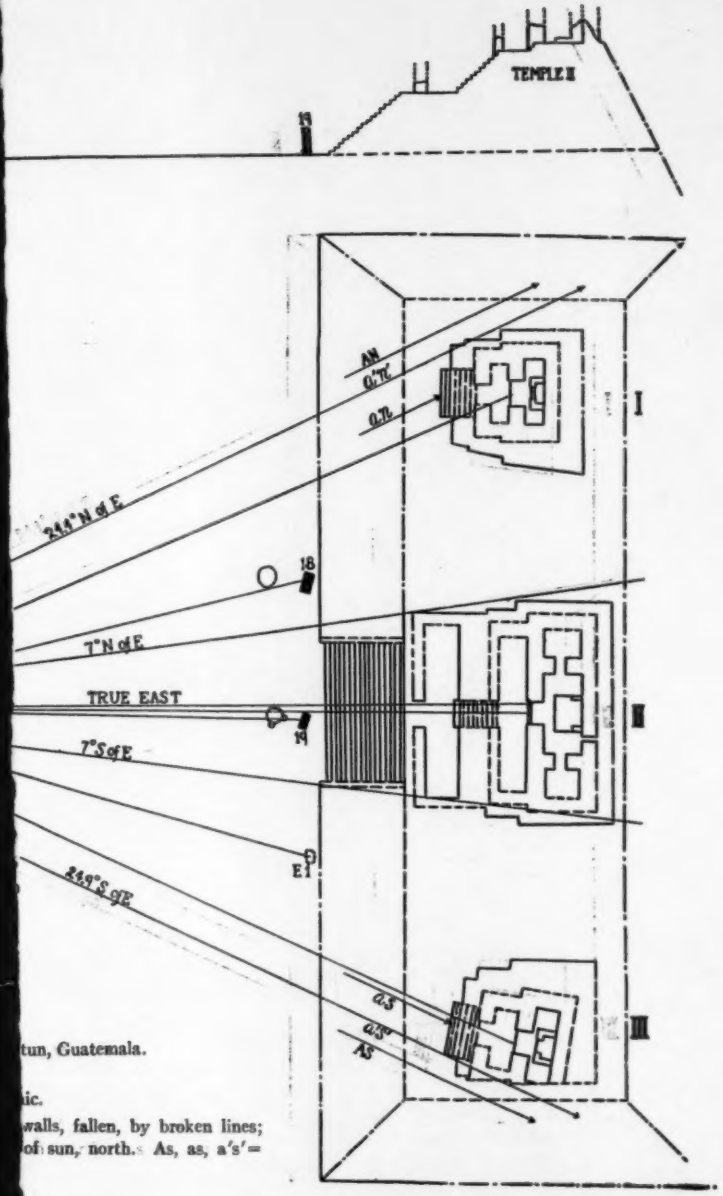


n of solar observatory in group E, Uaxactun, Guatemala.

(Courtesy of the Carnegie Institution)

All directions given are true or astronomic.

own by dot-and-dash lines; excavated walls, fallen, by broken lines; y solid lines. AN, an, a'n'=amplitude of sun, north. As, as, a's'=



tun, Guatemala.

ic.

walls, fallen, by broken lines;
of sun, north. As, as, a's' =

Data in regard to the following places or ruins were also obtained by the Department of Terrestrial Magnetism, during the years indicated:

	Lat. N.	*Long. E.*	*Mag. variation*	*Year*
Yaxha (Peten district, Guatemala)	17°04.5′	270°38′	5°57.4′E.	1909
Macanche (Peten district, Guatemala)	16°59.0′	270°25′		1909
Copan (Honduras)	14°50.4′	270°55′	7°08.4′E.	1926
		Long. W.	*Elev. in ft.*	
Copan, stela 10	14°51.0′	89°08.1′	2779	1926
Copan, stela 12	14°50.4′	89°14.5′	2553	1926
Copan, church	14°50.7′	89°06.4′	1958	1926

Of these, Uaxactun attracted much attention because of its prominent central position and the fact that it contains the oldest date so far discovered on a stela at any site in the Maya area, namely 8.14.10.13.15 8 Men 8 Kayab (approximately 68 A.D.). It was first reported in 1916. In 1924 another expedition was sent out for a preliminary survey of this site. This expedition, under the immediate charge of Mr. Frans Blom, felled a great deal of "bush" and thoroughly mapped the ruined city. As a result, measurements were made of group E, as it stood before excavation. This group consists of a plaza surrounded by four main mounds (see fig. 1). The map subsequently made by Mr. Blom shows this plaza as 316 feet long, north and south, by 133 feet wide, east and west, with structures E I, E II, and E III as small temple-mounds, completely in ruins, on a large platform mound, 230 feet long and 100 feet wide, bounding the east side of the plaza, and structure E VII as an unusually steep-sided pyramid on the west side, so completely ruined that it was almost conical in shape, with a much lower, flat platform extending from it to the south. It was noted that from the apex of structure E VII an observer could see well over the apices of structures E I, E II, and E III, and that to the east of this group the terrain slopes away quite steeply. With the forest felled, an observer on mound E VII could see the rising sun on the horizon in relation to mounds E I, E II, and E III.

Directly in front of mound E VII stands stela 20, and in front of the substructure mound on which stand E I, E II, and E III stand stelae 18, 19, and E 1. Mr. Blom made observations with a Brunton compass, correcting for the variation, and discovered that the lines-of-sight from stela 20 to the apices of mounds E I, E II, and E III—i.e., their approximate centers, since there was no time for the excavation necessary to determine their actual outlines—suggested important astronomic directions, being approximately 24° north of east, true east, and 24° south of east, respectively.[1]

These data the Department of Terrestrial Magnetism of the Carnegie Institution examined. It was found that the amplitudes of sunrise for this longitude and latitude are:

True horizon	*Visible horizon*	*Remarks*
24.6°	24.4°	Extreme values north of east on June 22
24.6°	24.9°	Extreme values south of east on Dec. 22

It would appear therefore that the lines-of-sight from stela 20 to the centers of mounds E I, E II, and E III were to mark the summer and winter solstices respectively, and the east line to mark the vernal and autumnal equinoxes.

In 1926 the Carnegie Institution of Washington initiated a five-year project at Uaxactun, and the first excavation called for on the program was an intensive examination of this group. Work was concentrated on mounds E I, E II, E III, and E VII.[2]

The plaza of group E, upon excavation in 1927, was found to be 308′ 5″ in length, north and south, and 150′ 10.5″ wide, east and west, bounded on the east by a platform mound 234′ 8″ long at the bottom and 15′ high, on which stand the very ruined temples E I, E II, and E III. Mound E VII, on the west side of the plaza, is fifty feet high, with extremely steep sides; it was found to be without a structure on its top and with the stairway on the east side. The construction of this pyramid was of the crudest sort, consisting of rough, broken stones covered with crumbling plaster. Under this disappointing exterior however an earlier temple was discovered, built in terraces, of well-wrought

[1] For full report, see Yearbook No. 23, Carnegie Institution of Washington, 1924.
[2] For full report, see Yearbook No. 26, Carnegie Institution of Washington, 1927.

stone covered with plaster still in excellent condition. Less than a week before the forced withdrawal of the expedition, on account of the exhaustion of the water supply, a mask of stucco over a stone core, about eight feet square, was uncovered on the eastern face of this inner temple, just north of the staircase of the outer temple. Further excavations will undoubtedly reveal other similar masks symmetrically placed, and hopes are entertained that this temple may yield pottery and ceremonial objects intact and important data on the relation of the Maya ritual to its calendar.

Temples E I, E II, and E III, on the east side of the plaza were also excavated so that their outlines could be followed on all sides but the back. They were found to face west—that is, towards the plaza—and each stood on a platform ten feet high. The substructure mound is 15′ high, as already noted, and is ascended by a central stairway, 34′ 6″ wide, consisting of 16 steps. The ground plans of these temples may be seen in the diagram.

The directions from stela 20, taken with a theodolite and using a correction of 7° 12′ E. for the magnetic declination of the compass in 1927, are as follows:

From stela 20 to	*True bearing*	*Degrees of arc from true east*	*Amplitudes of sun at Uaxactun*
Center of inner doorway, E I	N68°00′E	22°57′N	24.4° on June 22 (summer solstice)
Stela 18 (center)	N77°12′E		
Center of inner doorway, E II	S89°03′E		
North jamb of inner doorway, E II	True east	0°0′	Vernal and autumnal equinoxes
Stela 19 (center)	S88°15′E		
Stela E I (hole)	S74°18′E		
Center of inner doorway, E III	S65°18′E	24°42′S	24.9° on Dec. 22 (winter solstice)

As a check, angles of 24.4° to the north of, and 24.9° to the south of the true east-west line were measured off in the field from stela 20. These lines are labelled *a n* (amplitude north) and *a s* (amplitude south) in the diagram. Although they strike

temples E I and E III more or less in the center, they do not appear particularly significant, for we must remember that an observer standing at stela 20, on plaza level, could not make an horizon observation of the sun, on account of the substructure mound fifteen feet high which is directly across his line of vision.

Upon completion of the ground plan of group E on paper, however, similar angles were laid off from the point T, at the top of the stairway on pyramid E VII. These angles as extended are shown by the lines *A N* and *A S* on the diagram, falling well beyond the limits of temples E I and E III, respectively. Since the walls of these temples, which are especially dilapidated in respect to their outer veneer of surface stone, must lie between the lines *a n* and *A N*, and *a s* and *A S* respectively, it is evident that the amplitudes of the sun, from some point on the midline of the stairway of pyramid E VII, between the top and the bottom, would of necessity coincide with the northwest corner of temple E I and the southwest corner of temple E III. A point fifteen feet above plaza level was chosen, and from this were projected the lines *a' n'* and *a' s'*. It is interesting to note how closely they approximate the probable corners of temples E I and E III, respectively. The exact and absolute restoration of these corners is not possible, but this is relatively insignificant; the important thing is that an observer, by ascending or descending the stairs on pyramid E VII could bring his eye in line with the corners of these buildings and the rising sun on the horizon at the time of the solstices.

These facts determined, the directions to the corners of temple E II, from the same point, were examined. The only corner left intact in situ was the northwest corner of the temple platform. This lies 7° north of true east. Assistance was again sought from the Department of Terrestrial Magnetism of the Carnegie Institution, which had already supplied the astronomic data used above. So far as could be determined by them, points 7° to the north of and 7° to the south of the true east had no astronomic significance other than marking the dates of sunrise on April 6 and September 6, and March 3 and October 10, respectively. If we compare these dates with the dates carved on stelae

18, 19, and 20 in group E, interpreting the latter according to the day-for-day correlation of Maya and Christian chronology as advanced by Dr. H. J. Spinden, we find a close approximation of the April date, as follows:

Stela 18	8.16.0.0.0.	3 Ahau 8 Kankin	April 5, 97 A. D.
Stela 19	8.16.0.0.0.	3 Ahau 8 Kankin	April 5, 97 A. D.
Stela 20	9.3.0.0.0.	2 Ahau 8 Muan	April 3, 235 A. D.

Having taken the northwest corner of the platform under temple E II as the only intact corner available, any error is the maximum. Any point to the south—i.e., towards the location of the corner of the temple itself—will place the date earlier in April. To be exact, the diurnal northward march of the sun at this season in the latitude of Uaxactun is approximately 24′. The Department of Terrestrial Magnetism has tentatively suggested that this discrepancy of one day might be accounted for by the fact that the difference between a $365\frac{1}{4}$ day year over a solar year of 365 days amounts to just one day in 128 years, and calls attention to the difference in years between the earlier and the later dates in group E, 97 A.D. and 235 A.D., a period of 138 years.

The work in group E at Uaxactun is by no means concluded, and further examination may lead to the discovery of primary temples in mounds other than E VII. These might throw more light on the subject. One question however can appropriately be raised at this time, and that is whether this complex of buildings is a true *observatory*, or planned to mark the already known directions of the four significant annual positions of the sun? The writer is strongly in favor of the latter theory, for the following reasons:

1. The dates carved on the stelae in group E offer irrefutable proof of such an advanced stage in the development of the Maya astronomic and calendric systems that natural phenomena as usual as the solstices and equinoxes must have been well-known and accepted facts, understood at least by the initiated.

2. If the solstitial and equinoctial phenomena were well known to the Maya at the time of the setting up of the stelae, and if we are willing to concede approximate contemporaneity between the dates of erection of the stelae and of the mounds concerned, then the erection of so many buildings

as an *observatory* was an unnecessarily complicated business. Four perpendicular sticks a few inches high, correctly set up on a properly oriented board, would have served the same purpose.

The writer believes that these buildings were erected in their respective positions as temples dedicated to the four seasons, or the four most significant positions of the sun in the course of the solar year, and that their erection is to be more closely associated with geomancy than with astronomy.

A second structure which has yielded information of astronomic importance is of a totally different type. This is the so-called Caracol, at Chichen Itza, in Yucatan. In 1924, the extremely precarious condition of this building was noted, and early the following season the writer was assigned the task of supervising its repair. This work was done with the greatest care, not only because the moving of any stone might materially affect the position and consequent scientific value of the *ventana*, or window, which had long been suspected of features of astronomic importance, but also because the delicate position of the worked stones on the north side offered no slight risk to the two masons engaged in consolidating them in situ with cement. To have moved or jarred any of these stones would have brought down the whole window with possibly fatal results.

As is well known, the Caracol is a circular tower with four outer doors facing the cardinal points of the compass. Within is a circular corridor from which four more doors, facing midway between the cardinal points, lead into another circular corridor. This inner circular corridor surrounds a masonry core, inside which a small, spiral staircase leads to the upper part of the building.[3] Unfortunately, the upper terminus of the staircase cannot be proved, for, a little more than halfway to the level of the window, the whole northern section of the building has completely fallen. Near the very top of the structure is a flat area, from which opens the window above-mentioned.

In the process of repairing this building it was necessary to remove rocks and worked stone which were loosened and about

[3] W. H. Holmes, The Ancient Cities of Mexico, 1897, illustrates the structure very completely.

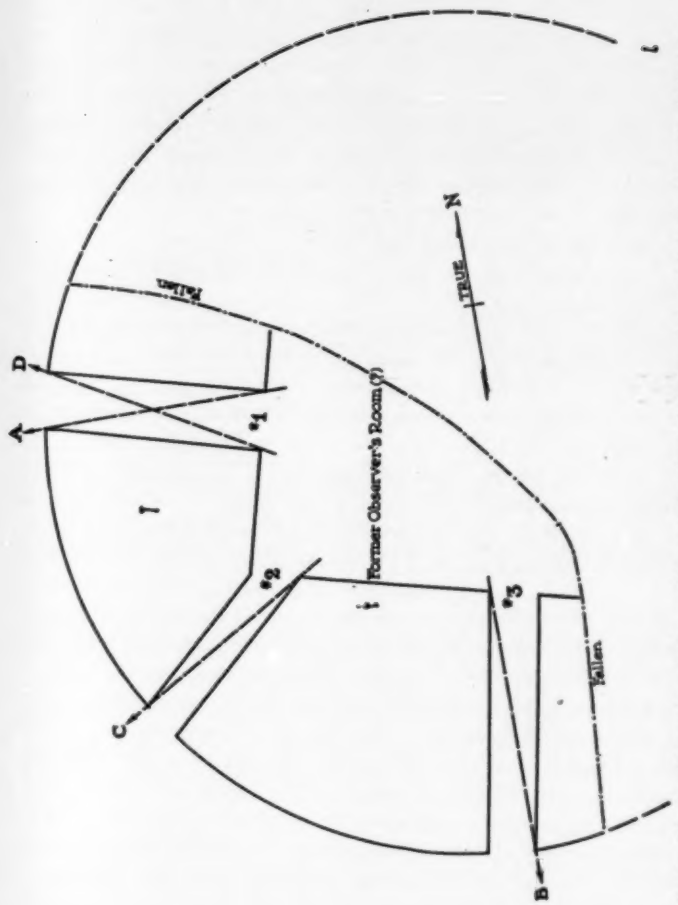


Fig. 2. Diagram illustrating relative position and directions of window, 1, 2, and 3, in the Caracol, Chichen Itza.

to fall, in order to remove the loose dirt before applying the cement. In doing this the presence of two more windows was discovered. One of these had been suspected, from an examination of Maudsley's photographs of the Caracol, though the exterior opening is scarcely discernible from the ground, and was quite inaccessible before repair of the whole top. The largest and best known window was therefore called window 1, its neighbor, facing to the southwest, window 2, and the last, facing south, window 3. The diagram (fig. 2) illustrates their relative position and directions; it is not however drawn to scale.

It is the writer's belief that these three windows opened from a rectangular room to which the hidden spiral staircase gave access. How many more windows, if any, opened from the other two sides of this hypothetical room no one will ever be able to say, for the northern and eastern sections have completely fallen. Not even a hypothetical restoration is possible here; in fact, we can only conjecture, because it seems reasonable, that there was an observers' room and that the spiral staircase led into it.

As to the results obtained from careful measurements of the three windows still in situ there can be no doubt. The directions of these windows and of their diagonals were necessarily taken with a Brunton compass, as the extraordinarily cramped quarters precluded the use of a theodolite, though an attempt to use one was made. The significance of the results is further enhanced by the fact that the measurements and observations were made by a man without even a rudimentary knowledge of astronomy, that is, the writer. The data were submitted to the Department of Terrestrial Magnetism, with the suggestion that the important lines-of-sight were not the actual directions of the windows themselves but of their diagonals. This conclusion was reached when the sun was observed to set on March 21st, 1924 (the vernal equinox) along the line A (see fig. 2). The results of this investigation are best described in a letter from the director of the Department of Terrestrial Magnetism, Dr. Louis A. Bauer, from which I quote:

> . . . . I inclose a diagram of directions or azimuths of the sun and moon at the time of their setting at Chichen Itza when their declinations for the

year are greatest; also a tracing to fit over the diagram, showing the azimuths of the windows and their respective jambs.

In the following notes the jambs are designated *right* and *left* as when *looking out*, and azimuths or directions are astronomical:

a Window 1. The direction, *right inner* jamb to *left outer* jamb is *due west.*

b Window 3. The direction, *right inner* jamb to *left outer* jamb is *due south.*

c Window 2. The direction, *left inner* jamb to *right outer* jamb is in azimuth 59° reckoned westward from south, or in *amplitude* 31°.

d Window 1. The direction, *left inner* jamb to *right outer* jamb has the same amplitude north of west (31°) as *c* is south of west.

The amplitude of the sun at setting on March 21, was 0° or due west, which accords with the direction under *a*. On April 28 its amplitude was 15° north of west, hence it appeared exactly down the mid-line of window 1, as you observed. The sun's amplitude on June 21 at Chichen Itza is 25°, consequently, it will not be seen setting in the direction given under *d* as you anticipated, but about 5° further to the left or westward.

The directions *c* and *d* are the directions of the moon at setting when its ascending node is in the vernal equinox; that is, when its declination is a maximum, about 28°36′. Nothing apparently marks the direction of its setting, 9½ years later when its maximum declination for the year is reduced to about 18°25′ and its amplitudes become 20° north or south.

Window 3 is not high enough for direct observations of the sun at noon or the moon at Meridian passages; hence if it was constructed for such observations, it must have been the shadows of the jambs cast by the sun or moon that were noted. Directions *a*, *b*, *c*, and *d* mark astronomical directions of local importance whether intentionally or unwittingly, but two directions remain for which I can assign no reason at the present time.

Another interesting feature of the Caracol was discovered by the removal of dirt and debris at this time, namely a circular, stone-lined, vertical hole extending down through the core of the building. This shaft was eight to ten inches in diameter, the walls of roughly finished stone, but owing to obstructions its depth could not be ascertained. Water poured into it seeped out through the core, but this is of no practical significance. Complete excavation of the whole building will be necessary to determine whether this shaft served a ceremonial, utilitarian, or an astronomic purpose. Should it be found to lead to a hitherto unknown room, perhaps beneath in the substructure, its use for taking a meridian sight of a celestial body would be a possibility.

These two discoveries are of importance in that they have opened a new and more practical field for the study of Maya astronomy. It is sincerely to be hoped that all towers in the Maya area, whether square or circular (of both types only a few instances are known), will be closely examined in the near future, and that all investigators, either when visiting old sites or exploring new ones, will take accurate and copious bearings whenever the opportunity offers or the faintest suspicion arises that the arrangement of buildings or structural features may have been designed in accordance with astronomical directions.

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NOTES ON THE PIMA, 1926

BY ELSIE CLEWS PARSONS

IN DECEMBER, 1926, I paid a brief visit to the Pima at Sacaton and Sacaton flats. Students of the Pueblo Indians had observed ritual similarities in Pima culture as described by Russell which seemed to call for special study. Were these similarities merely scattering or did they point to underlying resemblances of cult which Russell did not appreciate? Russell visited Pimeria in 1901–2. He was unfamiliar with the Pueblos about whom in recent years there has been a considerable increase of information.

In Russell's day comparatively little attention was paid by American anthropologists to systems of relationship and his account of the Pima in this respect is inadequate. In Melissa Jones, one of Russell's interpreters, I was glad to find a competent genealogist.

My survey then was twofold, becoming an analysis of the Pima relationship system and a comparison of Pima and Pueblo ceremonialism. A more comprehensive comparison might well be made, as well as a study of the changes in Pima life caused by contact with the whites, changes which have been rapid during the last three decades. Comparisons of Pima and Apache, and of Pima and Papago, are also desirable.

Pima Kin, Clan, and Moiety

Kin

Kinship is reckoned in both paternal and maternal lines through the fifth generation. No kinship terms are used in address between the first and fifth generations, but the fifth generation is referred to as "leg feather" (*kahio wopo*). Within these five generations marriage is precluded. To marry within the relationship[1] was "like going on a road with danger on it;" besides it would

[1] My relation, sing., *nyachu*, pl., *nyahachuni*.

arouse disgust. These bounds of exogamy and of reckoning relationship are thought of precisely and definitely. On the other hand there appear to be few precise duties or obligations for kindred in daily or customary life. Avoidance is not practised, there is no joking-relationship, there are no specific kinship responsibilities at birth, naming, puberty, marriage, or death. I did hear that when very sick a person would be visited by his relatives who would open the visit with an exchange of terms of relationship. Terms of relationship are exchanged also in ritual smoking and when concluding a narrative.[2] When Kisto[c] finished telling us the tale about Buzzard's daughters, narrator and interpreter shook hands, exchanging terms of relationship—which happened to be *tyō'ōs*, mother's brother (actually the narrator was a remote collateral) and *mal'*, sister's child.

Whatever the theory about a lack of kinship solidarity, close acquaintance with interrelated families would show, no doubt, some measure of responsibility. I recall one little incident. On one of our visits the house door was closed against our approach. Now the senior woman in that household was related to Melissa, their paternal grandmothers were sisters. The woman and Melissa called each other *sis*[c] and *sikur*[c], older (sister) and younger (sister). So before we left, Melissa scolded her *sikur*[c] for hiding from her, was she not her relation?

Connections through marriage are addressed by name. "I call him by his name, he is no relation to me," was the regular answer to enquiry about addressing an uncle by marriage (or an aunt, etc.). The Pueblo practice of applying the term to the relation by affinity corresponding to that applied to the connecting blood relative is quite unfamiliar. There is no rule against marriage with a deceased wife's sister or a deceased husband's brother, although Melissa stated very positively that for her part she would never entertain the idea of marrying her husband's brothers, as she felt as if they were her own. The descriptive terms for relations by affinity were not etymologized, but those between generations appeared to be based on a principle of what

[2] Cf. Frank Russell, The Pima Indians. B.A.E. Ann. Rep., 26: 199 (1904–5).

we may call grandparent teknonymy. Take, for example, the reciprocal *nyipahamatâk* which is quite plainly my daughter's child's father.

In the terminology, paternal and maternal lines are distinguished throughout, in both parent and grandparent generations as well as in the speaker's generation. There are distinct terms for the father and mother of each parent, for paternal and maternal uncles and aunts, and for paternal and maternal great uncles and aunts, for the two sets of parallel cousins, the children of two brothers and the children of two sisters, and for cross-cousins, the children of a brother and sister. Brother-sister terms are also used in the vocative for all these cousins. Strictly speaking, there are no brother-sister terms, only two terms for elder and younger. In case of cousins,[3] seniority is reckoned through the age relationship of the connecting relatives, back to the second, third or fourth generation. In the compounded terms for the grandparent generation only the terms for father's older brother or older sister are used. Sex is expressed in the parent and grandparent generations, but not in the speaker's generation, nor in most of the junior reciprocals. To sum up, the outstanding principles of the terminology are the principle of descent and the principle of seniority. Pima kinship terminology furnishes a striking illustration of how in the nomenclature of kinship, classifying principles may be found which are consistently and elaborately carried out in divorce from any relation to the contemporaneous social organization.[4]

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[3] Throughout the analysis I am restricting the use of this English term to members of the same generation.

[4] Excepting perhaps in connection with the tribal chieftaincy which appears to be hereditary, from father to eldest son, if the son is qualified. Anton Azul (see gen. II, 1) was chief during the Gold Rush of 1849. His eldest son, Antonio (gen. II, 6) who was chief in 1901 (Russell, 196) succeeded him (prior to 1864, ib.), and he was succeeded by his son, Antonito (gen. II, 17) who died in 1923. Harry Azul or Brown Eagle (gen. II, 32), a man of fifty-five, is Antonito's oldest son, and "Old Harry" was talked of at his father's death for chief. But Harry is a drunkard; "he is not a good man" for chief; "they will never choose him." As for the next son, George (gen. II, 35), "he is too young, his father never taught him anything." And so, since 1923 the office has been vacant. "Perhaps they will never have a chief again."

List of Kinship Terms

āk	father, desc.
ta'al	mother
alkuur	son, m.sp.
ailitak	daughter, m.sp.
mat'	son, daughter, w.sp.
wia'nak	brother, sister, desc.
sis'	older brother, older sister, voc.[5]
sikur'	younger brother, younger sister, voc.[6]
köle[7]	father's older brother. Recip. for m., *akööl*; for w., *chu' chut'*
hakit'	father's younger brother. Recip., *hakyimat'* (*nyakyimat'*)
työ'ös	mother's older brother. Recip., *mat'*
tatal	mother's younger brother. Recip., *ma'e*
âkâks[7]	father's older sister. Recip., *chu' chut'*
wowöt'	father's younger sister. Recip., *hakyimat'* (*nyakyimat'*)
tatâks	mother's older sister. Recip., *mat'*
jisk'	mother's younger sister. Recip., *ma'e*
vosk	father's father. Recip., *vosömat*
voskköle	father's father's brother
voskâks	father's father's sister
pa·p'	mother's father. Recip., *pahamat'*
pa·p' köle	mother's father's brother
pa·p'âks	mother's father's sister
ka'k	father's mother. Recip., *kahamat*
ka'kköle	father's mother's brother
ka'kâks	father's mother's sister
hu'ul	mother's mother. Recip., *mâs*
hu'ulköle	mother's mother's brother
hu'ulâks	mother's mother's sister
viakol	great-grandparent
viashöt	great-grandchild
wiokökam	father's brother's children. Recip. term
â'eta	sister's mother's children. Recip. term
wö'maka	father's sister's children and mother's brother's children
kahio wopo	Reciprocal between first and fifth generations

[5] Obsolete descriptive, *nysihö'ki* (cf. Russell, 373).

[6] Descriptive, *nyshurpitch.*

[7] Preceded by "father word."

1. M. Nonoi, Coyote, *apkya*_____
(Stirring)
+2. F. Chörlis, Coyote, *apkya*

3. M. Sipörö, Coyote, *apkya*__
+4. F. Sikachu, Buzzard, *v*

5. F. Sa'vi, Coyote, *apkya*____
+6. M. Kisto^{c}, Buzzard, *o*

1. M. Anton Azul, Buzzard, *vaaf*___
+2. F. Warup^{c}, Buzzard,__

3. F. Juana, Buzzard, *vaaf*
+4. M._____, Buzzard, *ma'v*
+5. M._____, Coyote, *a^{3}pap*

6. M. Antonio Azul, Buzzard, *vaa*
(övaat'ka)
+7. F. Katö^{3}öka, Buzzard,__
(Bow shadow)

8. F. Luisa, Buzzard, *vaaf*____
+9. M. Micala, Buzzard, *ma'*

10. F. Ho^{c}ho^{c}kyimale, Buzzard,
(Butterfly)
+11. M. Thomas, Coyote, *a^{3}*
12. F. Sikachu, Buzzard, *vaaf*__
(Mary)
+13. M. Sipörö, Coyote, *apk*

Genealogy I

, Coyote, *apkya*
kachu, Buzzard, *vaaf*

oyote, *apkya*
Kisto°, Buzzard, *okal*

7. M. William, Coyote, *apkya*, d. 1922
+8. F. Hannah, Coyote, *apkya*
9. F. Mary Melissa Jones, Coyote, *apkya*
+10. M. Solon Jones, Buzzard, *ma'm* d. 1918
11. M. Vaniko, Buzzard, *okal*
+12. F. Blanche, _____ _____
Kiomerhahak (Striking leaves)
13. M. _____, Buzzard, *okal*, d.
14. M. _____, Buzzard, *okal*, d.

Genealogy II

zzard, *vaaf*
—, Buzzard, *ma'm*
—, Coyote, *a'pap*

Azul, Buzzard, *vaaf*
)
'öka, Buzzard,
dow)

14. F. Emily, Buzzard, *ma'm*, 70 — 28.
+M. Juan Lewis, Coyote, *a'pap*, d. 29
15. M. Usif, Coyote, *a'pap*, d. — 30
+16. F. Savemaile, Coyote, _____
17. M. Antonito Azul, Buzzard, *vaaf*, d. 1923
(Hutuantuwahim, west moving)
18. +F. Siöp, Buzzard, *ma'm*, — — 32.

19. +F. Chölis, Coyote, *apkya* d. 1921 — 35.

37.

39.

40.

zzard, *vaaf*
cala, Buzzard, *ma'm*

yimale, Buzzard, *vaaf*
fly)
homas, Coyote, *a'pap*
, Buzzard, *vaaf*

pörö, Coyote, *apkya*

20. M. Peblo, Buzzard, *ma'm*, 77 — 43.
+21. F. Luisa, Coyote, *apkya*, d.
45.

22. F. Lus, Coyote, *a'pap*
+23. M. Joe Mack, Coyote, *a'pap*
24. M. William, Coyote, *apkya*, d. 1922 — 47.

+25. F. Hannah, Coyote, *apkya*
26. F. Mary Melissa Jones, Coyote, *apkya*, 58 — 48.
+27. M. Solon Jones, Buzzard, *ma'm*, d. 1918 49.
50.

Genealogy I

Villiam, Coyote, *apkya*, d. 1922
F. Hannah, Coyote, *apkya*
ary Melissa Jones, Coyote, *apkya*
. M. Solon Jones, Buzzard, *ma'm*
. 1918
Vaniko, Buzzard, *okal*
. F. Blanche, _____
Kiomerhahak (Striking leaves)
_____, Buzzard, *okal*, d.
_____, Buzzard, *okal*, d.

15. M. Frank, Coyote, *apkya*, 24
16. F. Lilian Jones, Buzzard, *ma'm*, 32
17. M. George Truman Jones, Buzzard, *ma'm*, 20
18. F. Angelita Jones, Buzzard, *ma'm*
19. F. Dora, Buzzard, *okal*, 30
+20. M. Frank Jackson (Maricopa)
21. M. Allen, 4
22. F. Annie

Genealogy II

ily, Buzzard, *ma'm*, 70
uan Lewis, Coyote, *a'pap*, d.
if, Coyote, *a'pap*, d.
F. Savemaile, Coyote, _____
tonito Azul, Buzzard, *vaaf*, d. 1923
tuantuwahim, west moving)
Siöp, Buzzard, *ma'm*, _____
Chölis, Coyote, *apkya* d. 1921
bblo, Buzzard, *ma'm*, 77
F. Luisa, Coyote, *apkya*, d.
, Coyote, *a'pap*
M. Joe Mack, Coyote, *a'pap*

28. F. Lâsa, Coyote, *a'pap*, d.
29. M. Tiwit, Coyote, *a'pap*, d.
30. M. Vigibwi, Coyote, *a'pap*, 60
(Eagle-down take)
+31. F. Paula (Papago)
32. M. Harry, Buzzard, *vaaf*, 55
(Mohatikipa 'ak, brown eagle)
+33. F. Maria, Coyote, *a'pap*, d.
+34. F. Annie (Oklahoma, Seneca)
35. M. George Azul, Buzzard, *vaaf*, 50
(Ötrajik, inside hole)
+36. F. Sarah, Coyote, *a'pap*
(Kânsi)
37. M. Âbuâka, Buzzard, *vaaf*
(Apache road)
+38. F. Andelia, Buzzard, *ma'm*, d.
39. M. Roy, Buzzard, *vaaf*, 35
(Shakakökyöwa, line standing)
40. F. Sarah Johns, Buzzard, *vaaf*
+41. M. _____ (Mex.)
+42. M. Thomas Johns
43. F. Pedro, Buzzard, *ma'm*
+44. M. Francisco (Papago)
45. F. Edith, Buzzard, *ma'm*, 26.
+46. M. _____ (Pueblo, San Domingo)
51. M. Johnson, Coyote, *a'pap*
52. M. Albert, Coyote, *a'pap*
53. F. Susie, Coyote, *a'pap*
54. M. Simon, Coyote, *a'pap*
55. M. Paul, Buzzard, *vaaf*
56. F. Esther, Buzzard, *vaaf*
57. F. Edith, Buzzard, *vaaf*
58. M. Keneth, Buzzard, *vaaf*
59. F. Consuelo
60. M. Henry
61. M. Frank

villiam, Coyote, *apkya*, d. 1922
F. Hannah, Coyote, *apkya*
ry Melissa Jones, Coyote,
kya, 58
M. Solon Jones, Buzzard, *ma'm*,
d. 1918

47. M. Frank, Coyote, *apkya*, 24.
48. F. Lilian Jones, Buzzard, *ma'm*, 30
49. M. George Truman Jones, Buzzard, *ma'm*, 20
50. F. Angelita Jones, Buzzard, *ma'm*
62. M. Allen, 4.

Terms for Relations by Marriage

vosamejik	daughter-in-law, m.sp.
	father-in-law, w.sp.
kaamejik	daughter-in-law, w.sp.
	mother-in-law, w.sp.
nyipahamatâk	son-in-law, m.sp.
	father-in-law, m.sp.
moiyâk	son-in-law, w.sp.
chuchumu	mother-in-law, m.sp.
kihŏ'	brother-in-law
nyakimaich'ŏ	older brother's wife
chuchutŏch'ŏ	younger brother's wife

Application of Kinship Terms in Genealogical Tables

vaaf, ma·m, okalt, apkya, a'papᶜ, father

Genealogy I

9>3	*apkya*, father
16, 17>10,	*ma·m* or *nyema*, father

ta'al, mother

Genealogy I

11>5,	mother
17>9,	mother

matᶜ, son, daughter, w.sp.; younger sister's child

Genealogy I

9>16,	daughter, w.sp.
9>17,	son, w.sp.

Genealogy II

12>26,	daughter, w.sp.
6>26,	younger sister's daughter, m.sp.
3>26,	younger sister's daughter, w.sp.

sisᶜ, older brother and sister and cousin of senior descent

Genealogy I

9>7,	older brother
17, 18>16,	older sister
17>15,	mother's older brother's son
16>15,	mother's older brother's son. 16 is older than 15; but the father of 15 was older than the mother of 16.

Genealogy II

20>14, mother's older sister's daughter. 20 is older than 14; but the mother of 14 was older than the mother of 20.

sikur^{c}, younger brother and sister and cousin of junior descent

Genealogy I

7>9, younger sister

16>17, younger brother

9>11, father's younger sister's son

17>19, mother's father's younger sister's son's daughter. 17 is younger than 19; but 19 is the descendant of the younger sister of the grandfather of 17.

Genealogy II

45>48, father's mother's younger sister's daughter's daughter. 45 is younger than 48; but his father's mother was older than the mother's mother of 48.

köle (compounded with "father word"), father's older brother and male cousin of senior descent

Genealogy I

17> older brother of father, *nyema·köle*[8]

chu^{c}*chut*^{c}, younger brother's daughter, m.sp., younger brother's child and child of male cousin of junior descent, w.sp.

Genealogy I

9>19, father's younger sister's son's daughter, w.sp.

Genealogy II

14>32, mother's younger brother's son's son, w.sp.

hakyimal, older brother's child, senior male cousin's child

Genealogy I

9>15, older brother's son

5>9, older brother's daughter

Genealogy II

26>32, 35, mother's older brother's son's son

26>40, mother's older brother's son's daughter

26>30, mother's older sister's son's son

26>43, mother's older sister's son's daughter

työ'ös, mother's older brother, and male cousin of senior descent

[8] Compounded with *ma·m*.

Genealogy I
17>7, mother's older brother
Genealogy II
26>6, mother's older brother

tatal, mother's younger brother and male cousin of junior descent

Genealogy I
16>11, mother's father's younger sister's son

ma'e, older sister's child, senior female cousin's child

Genealogy I
11>16, mother's older brother's daughter's daughter
Genealogy II
26>28, 29, mother's older sister's daughter's children

âkâks, father's older sister and female cousin of senior descent

Genealogy I
17> older sister of 10, *nyema·âks*[9]
19>9, *nyapkâks*,[10] father's mother's older brother's daughter

wowöt^{c}, father's younger sister and female cousin of junior descent

Genealogy I
15>9, father's younger sister
9>5, father's younger sister
Genealogy II
35>26, father's father's younger sister's daughter
40>26, father's father's younger sister's daughter
30>26, father's mother's younger sister's daughter

tatâks, mother's older sister and female cousin of senior descent

Genealogy II
26>3, mother's older sister

jisk^{c}, mother's younger sister and female cousin of junior descent

Genealogy II
28, 29>26, mother's mother's younger sister's daughter

vosk, father's father

Genealogy I
9>1, father's father

[9] Compounded with *ma·am*.
[10] Compounded with *apkya*.

vosömat, son's child, m.sp., male cousin's son's child

Genealogy I

1>9, son's daughter, m.sp.

Genealogy II

17>57, 58, son's son and daughter, m.sp.
26>57, 58, mother's brother's son's son's son and daughter
26>51–54, mother's sister's son's son's children

voskâks, father's father's sister and female cousin

Genealogy II

57, 58>26, father's father's father's sister's daughter
51–54>26, father's father's mother's sister's daughter

pa·p^{c}, mother's father.

Genealogy I

16>3, mother's father

Genealogy II

26>1, mother's father

pahamat, daughter's child, m.sp., brother's daughter's child, male cousin's daughter's child

Genealogy I

3>16, daughter s daughter, m.sp.
5>16, brother's daughter's daughter
9>22, father's sister's son's daughter's daughter

Genealogy II

1>26, daughter's daughter, m.sp.
26>59, 60, mother's brother's son's daughter's son and daughter
26>61, mother's sister's son's daughter's son

pa·p^{c} *âks*, mother's father's sister and female cousin

Genealogy I

16>5, mother's father's sister

Genealogy II

61>26, mother's father's mother's sister's daughter
59, 60>26, mother's father's father's sister's daughter

ka^{c} *k*, father's mother

Genealogy I

9>2, father's mother

kahamat, son's child, w.sp.

Genealogy I

2>9, son's daughter, w.sp.

hu'ul,[11] mother's mother

Genealogy I

16>4, mother's mother

Genealogy II

26>2, mother's mother

mâs, daughter's daughter, w.sp.

Genealogy I

4>16, daughter's daughter, w.sp.

Genealogy II

2>26, daughter's daughter, w.sp.

viakol, great-grandparent, brother, sister, cousin of great-grandparent

Genealogy I

16>1, mother's father's father

16>2, mother's father's mother

Genealogy II

45>1, father's mother's father

Child of

61>26, father's mother's father's mother's sister's daughter

viashöt, great-grandchild, great-grandchild of brother, sister, cousin

Genealogy I

1, 2>16, son's daughter's daughter

Genealogy II

26>child of 61, mother's sister's son's daughter's son's child

ñ'eta, reciprocal between children of sisters

Genealogy II

26>15, 20, mother's sister's son

15, 20>26, mother's sister's daughter

26>14, 22, mother's sister's daughter

wö'makal, reciprocal between children of brother and sister

[11] Nursery term, *lu'lu'*. Allen, aged four, thus called genealogy II, 26.

Genealogy I

9>11, father's sister's son
11>9, mother's brother's daughter
17>15, mother's brother's son

Genealogy II

26>17, mother's brother's son
17>26, father's sister's daughter

kahio wopo, reciprocal between first and fifth generations

Genealogy I

1>21, great-great-grandson

Genealogy II

62>1, great-great-grandfather

References in English to Kinship Terms

Our genealogist's accounts in English of how she reckoned or came by some of her kinship terms are significant enough of Melissa's classifying principles to be noted. "Juana, my mother's older sister, calls me just the same as my mother calls me." . . . . "Emily is like an older sister to me," Emily being Melissa's cousin of senior descent. "Lilian calls Frank [her mother's older brother's son] *sis*^{c} [older] because my brother is older than me." . . . . "Because Sâvi (my father's sister) was younger than Sipörö (my father), Vaniko is my *sikur*^{c} and Dora is George's *sikur*^{c}" . . . . "Peblo calls Emily *sis*^{c} because Luisa (Peblo's mother) was younger than Juana (Emily's mother)." . . . . . "Emily calls Harry *chuuchut* and I call him *nyakamat*^{c} (*nyakyimat*^{c}), because Juana (Emily's mother) was older than Antonito (Harry's father), and my mother was younger." . . . . . "Edith and Keneth I call just the same as their grandfather calls them," their grandfather being Melissa's cousin. . . . . "Consuelo and Henry I call *nyepâhamat*, because they come from a girl," by which Melissa meant that although they had the same grandfather as Edith and Keneth the term she and their grandfather used was different because he was their mother's, not their father's, father. . . . . Of Dora, the child of Melissa's male cousin of junior descent, Melissa said, "She will have to call me by the way I call my father." (For Melissa is as older sister to Vaniko, Dora's father, hence

Dora must use the term for father's older sister. Now this is compounded of *âkâks* and the proper "father word," i. e., the word Melissa applies to her own father). . . . . "Dora's child I call by Vaniko," another case of "as their grandfather calls them" (*pahamat*).

Clan

A peculiar trait in the kinship terminology is the use of the so-called "father words." In description the father is called *nyâk;* in address he is called by the name of his clan or name group: *vaaf, ma'm, okalt, apkya, a'pap*^{c}. As Thin Buckskin told Lloyd, "these bands were so called because it was by these names they called their fathers."[12]

Aside from classifying by descent, the "bands" or paternal clans have no functions whatsoever. They do not regulate marriage choices; they define no duties or obligations; they do not determine kinship (i. e., anyone outside of the five generations of recognized relationship is not thought of as a kinsman, even if he belongs to the same clan or name group, and no kinship term is applied; and, on the other hand, any one who is within the five generations of relationship *is* thought of as a kinsman, whatever his clan, and a kinship term is applied). In short the five clan names are mere names, like our own patronymics; nor can the five terms be translated. They have no meaning. According to Peblo Azul, it was Earth doctor or *dyosh* (sp. *dios*)[13] who planned these groups.

Formerly the child of an Apache father or of a Mexican or white was buried alive. The bastard of a Pima is not "respected," although there is a tradition which would probably be revealed in the folk-tales, that such a one will become a great man, a chief. The Pima bastard takes the clan of his reputed father. It would be considered *impossible*, to use Melissa's vehement term, for a child's descent to be reckoned through his mother, whoever was his father, Pima or foreigner. This attitude, given the mixed marriages occurring today, is undoubtedly a factor in the disappearance of the moiety and clan which is taking place.

[12] Lloyd, 147.
[13] See Russell, 251.

Moiety

The five clans are grouped by moiety. *Vaaf*, *ma·m*, and *okalt* belong in the Buzzard moiety; *apkya*, *a'pap*, in the Coyote moiety.[14] For the clan I could find no generic name; the moiety is referred to by the same term that is used between cross-cousins—*wōmaga—nyui wōmaga* (Buzzard moiety or cross-cousins), *bana wömaga* (Coyote moiety or cross-cousins). Naturally one is sorely tempted to interpret this terminology as pointing to a sometime exogamy. Given exogamous paternal moieties, the children of a brother and sister would necessarily belong to different moieties.

But today, as already indicated in discussing the clan or subdivision of the moiety, the moiety does not determine marriage choices. The moiety is, however, somewhat more than a name. It conveys group self-consciousness. This expresses itself in bragging[15] and formerly, at least, in fighting by way of hair-pulling. Buzzard people will say: "Buzzard is a great man, he wears black clothes like the President! Look at Coyote wearing his shabby clothes! He has nothing of any good, he searches for rotten meat!" Coyote people retort: "Coyote is a policeman. Don't you see that he wears a grey suit? He is always around when there is trouble, in order to make arrests. As for Buzzard he wears black like a Mexican woman in mourning for her husband with a red kerchief around her neck. Buzzard is just a fast woman. That is why she lost her husband and wears black." Buzzard people: "Buzzard is a great man; he always carries a gun! Coyote has nothing but a basket to carry rotten things!" Such bragging and "mean talk" may end in hair-pulling. It may start from a Buzzard or a Coyote killing the insect popularly called cow-killer[16] which is associated with the opposite moiety,—the red cow-killer is associated with the Buzzards, the white and yellow cow-killer

[14] Cf. Lloyd, 147. Russell groups *ma·am* and *va'af* as Coyote, *ākol*, *a'pap*, *apuki*, as Vulture (p. 197).

[15] How much so was illustrated when I enquired the moiety of Warup^{c} (gen. II, 2), my informant's maternal grandmother. She answered: "I guess it was Buzzard, because I always heard my mother say her mother would brag of Buzzard."

[16] Pima, *wihimör*, a kind of tarantula, according to Lloyd who saw it and correctly describes its status in the tribe (p. 163). Its bite is very poisonous. Russell erroneously refers to the insect as an ant.

with the Coyotes. A Buzzard woman is speaking: "We don't like to see that white bug. We will kill it. Then we begin to brag. Then the Coyotes will fight us, pull our hair. We can't use our hands in any other way; we just pull each other's hair." Probably this gaming temper is generally confined today to the children. But one characteristic incident occurred a few years ago among adults. There was a dead coyote lying alongside the road. My informant had passed by and had seen it lying there. The next time she passed the place the coyote was propped up and dressed up as a woman. (This would have been done by a Buzzard, for each side calls the name-giver of the other side a woman.) The third time she passed by, the coyote's clothes had been changed into those of a man. (This would have been done by a Coyote.) The story of Coyote meddling at the Emergence was said to be a brag by Coyote people of Coyote's power. "When the world was new, people were coming out of a hole below; baskets were carrying everything up. 'Look! look! there is no end to them!' said Ban (Coyote). The carrying all stopped. That Coyote spoiled it. If he had not spoken, the carrying would have gone on; heavy things would have moved themselves by their own power. But Coyote spoiled it."[17] Because of Coyote's laughter, Russell and Lloyd give the story,[18] the earth closed and the third Coyote clan remained below.

Pima and Pueblo Ceremonialism

The social organization of the Pima as just described is so different from that of the Pueblos of the West with their strong maternal exogamous clanship and moiety so weak as to be traceable merely in the ceremonial organization that a sense of dissimilarity of culture is at once aroused. Even when we turn to the eastern or northeastern Pueblos where clanship is weak,—among the Tewa a name merely,—and moiety marked, scant impression of similarity is made, clan and moiety patterns stamp so differently the general life. However, we may note that both among Pima and Tewa the moiety is paternal and that it does

[17] Cf. Lloyd, 148.

[18] Russell, 197; Lloyd, 148.

not control marriage choice. In kinship nomenclature there is also a degree of similarity between Tewa (and Taos) and Pima in their common emphasis upon the principle of seniority.

What of the ceremonial life? Among the Pueblos, as we know, it is complexly organized. There is an elaborate system of societies or sacerdotal chieftaincies, a comprehensive and fixed ceremonial calendar, and an all-pervasive ritual. Among the Pima ritual is restricted, and the ceremonies are (or were) few and loosely dated. With one exception the medicine men are unorganized. They are practitioners on their own, and, unlike the Pueblo, have undergone little or no initiation[19] and also unlike the Pueblo, they are unrelated to other parts of the social scheme, to the relationship system or to government. Obviously, in their ceremonial systems as in their systems of relationship there is radical differentiation between Pima and Pueblos. On the other hand, similarities in ritual are conspicuous, as the following list indicates.

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[19] To the Pueblo student familiar with initiatory ceremonial, highly formal and social, the following narrative by A'antopöi, Feather Twist, of how he became a medicine man (*sai°chukam*) will bring out some of the difference in character of the Pima from the Pueblo doctor. "When I was a boy as little as that little boy [pointing to a boy of four], I used to dream, and would run outdoors in the night. My parents would run after me. I began to feel I could see through everything. Darkness I could see through. Mountains I could see through. Water I could see through. There was always a light before my eyes. In my dreams a person came to me and led me around to show me what I should do as *sai°chukam*. He led me in dream through the mountains. I could not be still in the night-time. That person was the *ma'ka* (doctor) who lived when the world was new. He taught me his songs. Of myself I made nothing new. All was from *ma'ka*. I was never taught by any other. All I know I was taught by the *ma'ka* who came to me in dream. From others I might have learned bad tricks, to kill people. I listened only to the one who came to me in the night. [Russell states, 254–257, that doctorship comes not only through dreams, but through paternal inheritance and through the experience of snake bite.] Some *sai°chukam* live only a short time. I have lived long. For I have not tried to do more than I was taught to do. I have not twisted myself into trouble.

"Boys, two or three, have come and asked me to teach them. I enquired of them if they intended not to be mean to anybody, not to harm anybody, not to injure anybody's horse. [Cf. Russell, 267.] I said, 'If you agree not to do harm, go and sit in a certain place and I will sharpen a piece of wood and throw it at you. It will go through you and you will get some of my power.' [Cf. Russell, 257.] The boys all said, 'You put hard questions and conditions' and went off."

Pueblo and Pima Rites

1. Smoking for rain,[20] smoking the sick,[21] smoking over sacrosanct objects.
2. Use of corn husk or cane cigarette in ritual smoking and as offering (Pima, Lloyd, 89).
3. Exchanging kinship terms in ritual smoking.[22]
4. Use of anti-sunwise circuit,[23] and association of the directions with color.[24]
5. Birds and animals associated with the color directions.
6. Four the favored numeral, in description or in planning an event.
7. Mnemonic stick: bird's tail feathers used in count.
8. Prayer-sticks[25] and prayer-feathers.[26]
9. Arrowpoints which are believed to come from lightning, particularly white points.[27]
10. Crystal to diagnose disease.
11. Sucking out disease or ailment.
12. Eagle wing feathers used in exorcising.
13. Spitting or forcible exhaling in exorcising.
14. Taboo on salt during critical periods.[28]
15. Jugglery for magical growth of crops.[29]

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[20] For Pima, see Lloyd, 219–220, 230.

[21] Russell, 260. The doctor blows smoke also towards his own heart (E. C. P.), a form I do not know of among the Pueblos.

[22] For Pima, see Lloyd, 221. Particularly marked in the western pueblos.

[23] Pima: In smoking, beginning in the east (E. C. P.), with a request that those to whom the smoke is blown have pity (E. C. P.). The first whiff of cigarette smoke was puffed towards the sun (Russell, 251).

[24] Pima: east (white), north (yellow), west (black), south (blue); Zuñi, Hopi, Keres: east (white), north (yellow), west (blue), south (red); Isleta: east (white), north (black), west (yellow), south (blue); Tewa, Taos: north (blue), west (yellow),

[25] Pima and Zuñi: bundled in a set of four or more (Pima, Russell, 106–7; Lloyd, 136–7). Zuñi prayer-sticks are offered in many other ways also; but bundling is a characteristic not found in the other pueblos. Permanent prayer-sticks are also a feature common to Pima and Zuñi. Pima prayer-sticks were offered in springs, buried at the grave of a medicine man, and under the posts of a house; they were pressed on the person of a patient and used in warfare. (E. C. P.; also Lloyd, 135; Russell, 258, for burying prayer-sticks in field.)

[26] Pima (Lloyd, 219); offered with a request or prayer; a common Pueblo feature.

[27] Recently the pole in the center of a thrashing floor at Sacaton was hit by lightning. "Somebody said that if we dug into the hole we would find a lightning stone, sharp and white." (E. C. P.) *White* arrowpoints are particularly valued in Isleta ritual.

[28] Marked in the western pueblos, not observed in the northeastern.

[29] Marked among the Hopi.

Lending themselves less easily to tabulation are certain theories or conceptions of religion or magic held in common by Pueblos and Pima. Both hold to the theory of homeopathic magic that disease is caused and cured by the same thing, and among both peoples foremost among the causers and curers of sickness are mammals, birds, and insects.[30]

As the medicine-men get their powers through the animals it is logical enough that medicine-men are thought of as causing as well as curing disease, and this theory of their twofold character, maleficent and beneficent, is both Pueblo and Pima; but it is more emphasized among the Pima than among the Pueblo. The killing of Pima doctors held responsible for deaths or epidemics was not infrequent.[31] For like reasons persons have been

[30] The Pueblo data are very scattered, or still in MS, but Stevenson has given them for Zuñi and Sia, and Dumarest for Cochiti. For the Pima, see Russell, 262–65. To this I would add a note from Melissa Jones. When Melissa was a little girl of ten living at Blackwater she had fainting-spells and her father summoned one who in his day was a great medicine-man, O'köta. Over Melissa he waved his eagle wing feathers, "to make it clear, like blowing away smoke." (Cf. Russell, 260). Then he looked into his crystal to find out what was the matter with her. He tied a bunch of downy owl feathers around her neck. (Fainting sickness is caused by Owl, Russell, 263). Also he put or seemed to put into her body the pointed butts of the peeled willow sticks called *âmina*, four of them, with downy eagle feathers. (Cf. Russell, 259). O'köta said to her father, "Now she will live as I live. My power will go into her. When I die, she will die" .... "I did get well, but I did not die when he died," commented Melissa. She recalled Ó'köta blowing on her and singing. He did not suck; "but every *saĭ'chukam* does suck." (Cf. Russell, 261).

[31] See Russell, 262. In one afternoon I met a young man whose father, a medicine-man, had been killed because he had caused dysentery in the children, having buried his "bundle" on the edge of the village, and a middle-aged woman whose brother had been killed as a maleficent medicine-man. The attitude of the companion who told me these histories struck me as quite different from that of the Pueblo towards either his ceremonialists or his witches. The difference appeared plainly on our visit to Feather Twist. With some derision Melissa first referred to him as having no teeth, because of his practice of taking fire into his mouth. (Cf. Russell, 259). She added that she no longer believed that he or any other *saĭ'chukam* could harm her. Still at another moment she said she would be afraid to stay over night with me in a house in the fields of Sacaton flats, lest the *saĭ'chukam* did something to the house which would make her sicken and die. As we heard Feather Twist driving his horses with a load of wood on the road behind us Melissa exclaimed, "There he comes. Hear him call! He calls that way because he thinks as he is medicine-man he can pass by any one." She resented him, she laughed at him, and she was afraid of him. Now the Pueblo attitude towards ceremonialist or rather towards the ceremonialist reputed to be a witch, is one of much apprehension, but without admixture of derision or resentment, at least as distinct from hostility. It is a far more respectful attitude.

killed among the Pueblos, but these persons were not always doctors. Pueblo witches may or may not belong tothe hierarchy, although it is plain from much scattered evidence that the hierarchist is more subject to suspicion of witchcraft than the layman. I advance the theory in this connection that Spanish conceptualism of witchcraft has been at play, influencing the Pueblos to hold that witchcraft may be practiced by any one. The Hopi, less subject to Spanish influence than the other Pueblo peoples and so somewhat of a touchstone as to what is of Spanish provenience, are comparatively unsuspicious of witchcraft by neighbors and relatives.

The Pima medicine-men are differentiated into disease doctors (*sai'chukam*) and doctors (*ma'kai*) for weather, crops, and war. Curing and weather control are distinctive functions also among the Pueblos. The differentiation at Zuñi between the rain-making fertility groups and the curing groups is particularly marked. The scalp ritual of Zuñi as a rain-making cult is also peculiarly comparable to Pima theory and practice. "When an Apache is killed it will rain," said Thin Buckskin.[32] The Apache hair was kept in a jar in a cave, to be used in calling wind or rain.[33] I was told that scalps were kept in a special house in a basket or new piece of pottery. The scalps had life. If a solitary person approached, the scalps would whistle or make a noise, scaring anybody. The scalp keeper had to be an old man, the *chornym*, war chief.[34] The scalps kept in the kivas at Isleta are also said to be noisy. The Isletan scalps effect cures for toothache and for sickness from worry or longing. Pima scalps also effected cures.[35]

I referred to the exceptional case of organization among Pima ceremonialists. This was in the Navichu cult, a mask cult for curing which is undoubtedly related to the Pueblo (and Navaho and Apache) mask or kachina cult.[36] I will give my notes on the

[32] Lloyd, 185.

[33] Ib. 188.

[34] Smoker or war speaker, Russell translates. These officers were temporary, he says (p. 196); but he does not say who looked after the scalps.

[35] See Russell, 165. Also they caused paralysis of one side. Cf. Russell, 205. I am reminded of the "twisting sickness" caused and cured by the *wöwöchimtu*, a sometime warrior society of the Hopi.

[36] Throughout the Pueblos, masks are associated with the medicine societies. In

cult which, although scanty, bring out the ritual parallelism somewhat more plainly than the earlier accounts.

The impersonator of *navichu* is the head man or doctor and the office is or was hereditary, from father to son. There is another single mask, *kâksh'pakam*, who is the head of the group of eight or ten male impersonators called *vipinim*. These impersonators are visited by the *navichu* impersonator before sunrise and, "while still asleep," sprinkled with corn meal as a summons to participate.

The ceremony was held outdoors, in the day time. The *navichu* was the first out, making domiciliary visits to collect food and pigment for his ritual stick. It was he who assembled the paraphernalia at the place of curing to which the patient was to be brought. Navichu liked to have lots of children follow him to help carry his things. If a child fell, Navichu would whip or stroke him as he would the patient, otherwise the child's knee would swell up and the child would die. Melissa relates that when she was a child in Blackwater the *navichu* impersonator was her grandmother's brother. The family wanted her to follow behind him "so she could get the good of him, and not fall sick." But she was "scared of Navichu." He carried a bow and arrows. However, she followed him, but, being frightened, she looked at him and not where she was going and so fell into a hole. The other children cried out, "Navichu, somebody fall! Somebody fall!" But without waiting for Navichu to come and exorcise her, the little Melissa picked herself up and ran home. In later life when rheumatism developed in Melissa's knees her mother would say to her, "That is what you get from not letting that Navichu cure you!"

Navichu carried eagle wing feathers to clean (exorcise) with, also his stick. After drawing the sickness from the patient he shook the stick in the direction of the Apache, to the northeast. Navichu wore a long cotton garment, belted in, and a cotton

the western pueblos the independent kachina organizations have curing functions, although here as well as in the East their paramount function is rain-making and crop bringing. I learned of no rain-making function in connection with the Pima mask cult; but Russell states (p. 266) there was one.

cloth mask, the openings for the eyes painted. Sometimes two *navichu* came out. The mask of Kâksh'pakam was of gourd, red and white. Kâksh' pakam had a loud call, which he had to give four times before the *vipinim* could sing. He jumped up and down, he acted funny. The masks of the *vipinim* were also of gourd but less vivid than Kâksh'pakam's. These impersonations did not dance but stood in front of the patient, waving the colored stick about two and a half feet long each carried, in front of him and passing it over the patient, from his head down. The patient would pass his hand over the impersonation and then on himself, communicating the power. Patient and impersonations called out a! a! And the *vipinim* sang to basket and notched stick playing.[37] Kâksh' pakam would sprinkle meal on the basket.

Navichu had a dance, a pretty one. The *navichu* impersonator was in charge of the masks. And it was to Navichu that the bag of meal was taken by the patient's family as a request to hold the ceremony. This request would not be made until the sickness which was of a lingering kind, perhaps consumption, was seen by the medicine-man to be from the *vipinim*.

The *vipinim* are said to live below a certain pool or spring somewhere south of Sacaton at the foot of a mountain.[38] This spring at one time threatened to flood the world. Then two orphan children, a boy and a girl, were arrayed in best clothes and with feathers in their hair, and sent into the spring, whereupon the flow of water ceased. In time of drought, at night, the children might be heard crying. From which it was known that the year would be poor, and offerings of food and money and beads were made in the spring. If the year was to be good, with rain, the children were quiet.

Here we have the well-known Zuñi tale of the boy and girl sacrifice, and incorporated in the Pima cult are some character-

[37] Cf. Russell, 266. Lloyd, 208–9. Note the association between mask and turtle (ib. 206), a Pueblo feature.

[38] Over the spring is a stone. Should anyone start to lift it, a great wind would blow him away. The place is kept clean and fenced around. The people living here and looking after the place are referred to as *anakam*. There is said to be a government school near by. Inferably an actual shrine is being referred to. Russell places the home of the supernatural *navichu* on a mountain (p. 266), kachina like.

istic Pueblo rites not all of which were listed in our table of Pueblo and Pima parallels—besides passes with ritual sticks, and exorcism with eagle feathers, which were listed, notched-stick playing, domiciliary visiting, and, most ubiquitous of all Pueblo rites, sprinkling with corn meal, and offering meal with a request or prayer. I incline to think that the Pima mask cult is a borrowed Pueblo complex.[39]

From my brief survey of Pueblo and Pima culture I remain with two outstanding general impressions which are by no means novel but are still, I venture the opinion, too little regarded. First, that similarities between two cultures must be studied in their integral settings to be weighted or appreciated truly; second, that ceremonialism in the Southwest, perhaps elsewhere, is in each culture a complex of rites distributed outside of the particular culture, but coordinated distinctively in it,[40] and that knowledge of the distribution of ritual, much more knowledge than we have as yet, is necessary for understanding the genius of any single Indian culture.

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[39] Perhaps by way of the Apache. Here we might note the decided resemblance, not at all to the Pueblo, but to the Apache, of Pima adolescence theory and ritual. At first menstruation a girl was sent to stay for four days with some admirable woman that the girl might take after her in later life. (Compare Russell, 182). The girl had to be exorcised with his eagle wing feathers by the doctor (*mâka*), lest she be struck by "Thunder"—"the danger (*staöb'tama*)had to be cleared awaý." As in the case of newborn child and mother, over the menstruating girl the doctor shook his eagle wing feathers, violently from side to side, at the same time blowing or spitting. He gave her medicine-water and blew smoke on her. There was also a dance by a line of men dancers, including the doctor, and a line of women dancers, the girl standing in the middle of the line. About fifteen years ago the government agent forbade this dance which the people think of as their outstanding tribal festivity.

Let me note here that the sense of danger from "Thunder" is much more marked among Pima than among Pueblos. Dr. Goddard tells me it is very marked among the Apache.

[40] Much the same is true, of course, of other cultural systems or traits. Take folktales, and a comparison of Pueblo and Pima tales. There are many common incidents—creation from epidermis (Zuñi); placing the sun, moon and stars (Hopi, Keresan); Coyote as cosmic mischief maker (Hopi); emergence by clan (Hopi, Zuñi); search for the Middle (Zuñi, Keresan); flood and mark of flood on a bird's tail; and sacrifice of boy and girl to still the flood (Hopi, Zuñi, Keresan); twins with powers; magical impregnation—but, with two or three exceptions, tales as a whole are quite distinctive and not comparable in the two cultures.

Metal work of reclining bull in relief. Part of a frieze from the temple of Tell-el-Obied Ur Chaldea of Sumerian work, date 3500 B.C The head is cast copper about 1/4 inch thick, body plates of bull, sheet copper about 1/32 inch thick. This interesting specimen of prehistoric metallurgy was excavated in 1923 and is now to be seen in the Museum of the University of Pennsylvania.

THE EARLIEST ORNAMENTAL METAL WORK

By GEORGE BRINTON PHILLIPS

THE DISCOVERY of a metal frieze of bulls in the ruins recently excavated at Tell-el-Obeid, Chaldea, by the expedition of the University of Pennsylvania is not only an interesting archaeological discovery, but one of peculiar metallurgical significance. This metal work from historical evidence dates back to about 4000 B.C. and shows that even at that remote period the artistic mind could devise ornamental metal work, showing cultivated taste as well as considerable skill and knowledge in the art of metallurgy.

These ancient metal workers of copper, the Sumerians of Babylonia, if they did not have native copper to work with but only *ores*, must have acquired the knowledge of these ores and the process of smelting them, in itself a great advance over the Stone Age.

The ruins in which this metal frieze was found were in

the temple of the goddess Ninkhursag erected by King A-an-ni-padda 1st dynasty of Ur or about 4300 B.C., third dynasty according to Babylonian tradition after the flood.[1]

The frieze was a row of young bulls lying down with their heads turned towards the spectator. The remains of four of these metal figures were found, height 0.22 m., length 0.70 m. The bodies are made of plates of copper hammered over a carved wooden body in relief, thus giving form and detail. The head is of cast metal, hollow, still containing a core of bitumen, the metal being about 1/4 inch thick. It was secured to the wooden body by a peg in the head, and a thin plate of metal joining the head to the body was fitted around the neck, hammered down, and nailed. The ability to produce sheets of metal and cast figure-heads of copper was evidence of accumulated knowledge and showed considerable experience in the working of metals. In those early days there was no steam machinery for rolling plates, so the melted copper must

[1] Report of C. Leonard Woolley, Director of the University of Pennsylvania, of the expedition to Chaldea in 1923.

of prehistoric metallurgy was excavated in 1923 and is now to be seen in the Museum of the University of Pennsylvania.

have been poured out on a flat stone and hammered thin with a heavy stone, unless the knowledge of iron and iron implements was contemporaneous with copper which would make the antiquity of iron much greater than that usually assigned it. The thickness of the copper plates was not probably over 1/16 inch or less, but owing to the extreme oxidation its thickness is uncertain.

The head of the bull was a more difficult undertaking. As several of these cast heads were required, first a model of the bull's head was needed, carved in wood or possibly modeled in clay. This pattern was placed nose downward and damp sand was packed around it, the pattern being removed when the mould was dry. A core now of bitumen and clay was made and carefully adjusted in the mould, leaving a space which was to be filled in with the melted metal. Judging from the appearance of the cast head, this probably was the process used, although the *cire perdue* method may have been a well known process in antiquity.

To the metallurgist the composition of the body plates and cast head is a subject of considerable interest. Did these ancient workers in metal in the fifth millennium B.C. know anything about the alloy "bronze," and its superiority for casting? To decide this question, what was the composition of the manufactured metal, the oldest so far discovered? Analyses of the body plates were made for the writer at the University of Pennsylvania by Dr. D. L. Wallace and of the metal of the "cast head" by the courtesy of Dr. George K. Burgess of the Bureau of Standards, Washington, D. C., with samples kindly given the writer by the late Dr. G. B. Gordon, Director of the University Museum.

Metal Plates of the Body Assayed

The sample was so completely corroded that no metal was evident, consisting of fragmentary scales of carbonate of copper and oxide of copper. This was reduced to metal by heating in a stream of hydrogen and the metal assayed gave:

Copper 84.00%
Iron 1.50%
} Tin, lead, and other metals examined for but not detected.

There was considerable siliceous matter, etc., adhering to the

copper, which prevented a complete and satisfactory analysis; the indications, however, were that the metal was not an intentional alloy but simply copper.

The analysis of the cast heads of the bull was accurate and complete. The borings (showing only a slight corrosion of the metal) were assayed at the Laboratory of the Bureau of Standards, Washington, D. C., with results as follows:

Copper	95.00%	Tin, nickel, zinc, manganese, antimony, bismuth, and aluminum tested for but not detected.
Lead	1.60%	
Iron	0.80%	
	97.40%	

The metal proved to be simply copper with some little impurity not purposely added.

Another analysis made of metal from "Bulls of Tell-el-Obeid," reported by Dr. Besch of the Sumer Committee, 1924, gave as follows:

Copper	95.62%	Zinc and tin traces. Lead and arsenic and antimony completely absent.
Iron	0.75%	
Nickel	0.09%	
Sulphur	0.07%	
Silica	0.96%	
	97.49%	

This analysis, giving the amount of copper as 95.62%, nearly agrees with the analysis of the metal of the cast head 95.00% made by the Bureau of Standards, Washington. These analyses confirm the belief that the metal of the bulls, both cast head and plates was the same, not bronze or any special alloy of copper, but simply copper with a little impurity. It also suggests that these ancient metallurgists were not familiar with the "closed mould" and the advantages of using a copper alloy in casting.

That the metal industry seems to have been practised at a very remote period is shown by a statement in the Old Testament, Genesis 5, verse 22, which states

Tubal Cain was an instructor of every artificer in Brass and Iron.

This suggests the question, What was brass in those days? Modern

brass is an alloy essentially of copper and zinc, often with lead and other metals. "Zinc," the distinctive ingredient of brass, was unknown as such until discovered and identified by Paracelsus in 1520 A.D., and it is not possible that a "brass" could have been intentionally manufactured with copper and metallic zinc *before* that date. If it was made, it could only have been by smelting together copper ores and those containing zinc, a metal then unknown.

The word "chalkos" translated from the Greek means not only brass, but copper and also the alloy bronze, so there is little chance to identify "brass" with the alloy of copper and zinc as we know it now.

An inquiry was made at the British Museum, London, about specimens of "Prehistoric Brass." The writer was informed by Mr. Sidney Smith that there were *no* specimens of prehistoric brass in that museum or in *any other* museum and that the "translation of the Hebrew word by "brass" was an anachronism. Had brass objects spoken of in the Old Testament existed in the time of the building of the Temple at Chaldea with its copper frieze, some such brass objects would surely have been discovered in the numerous explorations in the Holy Land.

Specimens of brass, the work of the time of Tubal Cain "artificer in Brass" who was contemporary with Noah, would date the production of this metal three dynasties before the reign of A-an-ni-padda, and date back the antiquity of brass to *before* the flood. The word translated "brass" can only refer to copper, which occurring native in some countries was easily melted and cast and the statement cited about Tubal Cain must be considered an inaccurate tradition or translation as at that time the ancient metallurgist had no means of discovering the composition of the metal they used, as chemical analysis was unknown.

Sir Flinders Petrie, in reply to an inquiry about prehistoric brass in Egypt, informed the writer that "there may have been a 'true brass' used in the third century A.D.," that Roman coins contained zinc in consular times, the alloy being copper 62.72%, zinc 4.0%, lead 16.25%. Under the early Emperors the alloy for coins was copper 75.8%, zinc 6.20%, tin 3.05%; in the 3rd

century A.D., it was copper 71.77%, zinc 1.5%, tin 5.20%, lead 1.13%; in the 6th century A.D., copper 97.0%, zinc 2.3%, tin 1.0%.

These different alloys must have been obtained from smelting together copper ores with those of zinc or tin, giving a variable alloy. As the metal zinc had not been discovered until some 12 or 15 centuries later, it is quite impossible that these ancient metallurgists were acquainted with the *different metals* forming the alloy, but only knew that the metal obtained was suitable for coinage. It required the experience of the analytical chemist of the present day, with his knowledge of the metallic elements, their tests, and instruments of precision, to determine the composition of an alloy of these prehistoric specimens. Thus far, it would seem that the most ancient objects of copper yet found are either *native* copper or copper reduced from very pure ores and not a *bronze* as sometimes is reported, and that the knowledge of the use of the metal copper dates from 4000 B.C., possibly a little beyond, and establishes an antiquity for the use of metals of interest to the archaeologist and the metallurgist and indicates the advanced civilization of the Sumerians.

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THAT QUESTION OF RACIAL INFERIORITY

By G. H. ESTABROOKS

NEEDLESS to say, the problem of racial inferiority is one on which every person has the greatest difficulty in arriving at an unbiased conclusion. Any member of any group will violently resent insinuations that he comes from inferior stock whereas it is extremely difficult for the "Nordic," who at present is more or less top dog, to think calmly when other races hint that his superiority is due only to the accidents of environment and does not depend on some kind of divine dispensation.

We might point out here that the anthropologist, who really should be in a position to pass a historical judgment, if nothing more, is extremely moderate in his claims. In preparing his thesis the writer canvassed a number of the outstanding anthropologists of this country and England as to their attitude on racial differences in intelligence. There was an almost striking unanimity of opinion. A few stated definitely that no such differences existed. Most of them admitted that it seemed reasonable to expect certain differences to be correlated with the obvious divergence in physical characteristics. But all were agreed on one point, namely that these differences had not as yet been proved and that existing works which professedly bore on racial intelligence had certainly not established the inferiority or superiority of any of the groups in question.

Historically, the picture is not convincing. We see all the really great advances of the past made by people who belonged to very different racial strains and who certainly were not predominantly Nordic. The civilization of Egypt, and the Euphrates valley, the invention of the alphabet and of our numerical systems, working in metals, the beginning of agriculture, the art of weaving and of pottery all belong to various races and none can be proved as contributions for which we must thank the North European. Even more, when we come to America we find that the Maya and the Peruvian had made great strides towards civilization quite without any help from Europe or Asia—probably. The Maya

had invented a very complete calendar system and had struck on the idea of using zero all by himself in addition to general advances in culture while the Peruvian was doing work in weaving and in masonry never surpassed either before or since.

Moreover the assertion that the inspiration of Egyptian, Babylonian, Phoenician, Carthaginian, and Roman culture came from Nordic sources simply will not hold water. These so-called facts are speculations of the very wildest kind, and so far as I am aware are quite incapable of proof by modern anthropology. There certainly were incursions from the north into the Mediterranean basin at various times generally long after the real basis of Mediterranean culture was established. But these invaders seem just as often to have been Alpine as Nordic and their contribution generally consisted in overturning existing cultures which sometimes were able to recover—one might almost be tempted to say, after the Nordic had been sufficiently assimilated to allow culture again to progress.

From an historic point of view the case for the Nordic is not very impressive. Too often he appears as a typical child of the dragon's teeth—his duty was to tear down cities, not to build them. A careful examination of more recent work on the subject indicates that even here the case of superiority is far from being proved.

This recent evidence has been largely based on results of intelligence tests given to various "races" in this country. Two primary objections can be lodged against the results. In the first place, no effort whatsoever was made to treat the groups on a racial basis, and secondly the intelligence tests, all things considered and linguistic handicaps taken into account, almost certainly did not yield valid results even on those groups which were tested.

Let us consider the first point. If we are going to determine racial differences in intelligence, we must test the intelligence of "races." The anthropologist determines race on a physical basis. Color of hair or of eye, shape of head, stature, facial index and such characteristics form his basis of classification. "Italian" means nothing in a racial sense. There are light and dark Italians,

tall and short, long-headed and broad-headed, thick-nosed and thin-nosed. The Italian is a member of a nation if you will, but it proves nothing from a racial point of view to show him inferior to, let us say, the Jew, who is also from a very mixed stock, the Negro in the United States who is often more white than Negro, or the old stock American who, while probably mostly Nordic in descent, represents by no means a pure group.

To be sure, if we could prove the Negro definitely inferior we could come to the supposition that this inferiority was probably due to the presence of Negro blood and leave it at that. The same applies to the Indian and the Chinaman. Also if we could conclusively show that the Southern Italian, who is mostly dark was inferior to the blond Scandinavian, that also would be a point worth making. But in so far as I can see, this has not occurred to the majority of writers on racial psychology. They have assumed that Italian or Jew or Malay were racial terms per se and left it at that without even taking the trouble to point out that they were really testing—or trying to test—"national" intelligence and that racial differences could only follow as a secondary and very doubtful inference. I insist that this is a point of the first magnitude and am glad to note that certain writers, notably Hirsch, are turning their thoughts in this direction.

A true definition of race is important but a valid measurement of intelligence is quite as essential in such work. Here again we have erred seriously in times past and have only lately realized the extreme difficulty of getting a satisfactory measurement of intelligence in a group wholly different from ourselves, when, as it happens we are to make the yard-stick. The writer was struck by the fact that almost every anthropologist with whom he came in contact had but scant use for the intelligence test as applied to this task.

It is obviously unfair to test an Italian child by devices which presuppose a thorough knowledge of the English language. Pintner's experiment at Youngstown drew attention to this problem and since then we have had a growing realization of the seriousness of this language handicap. This has culminated in

the recent survey in the Philippine islands wherein the native children, we are told, were as much as three years behind American children in verbal tests, practically equal to them in non-verbal tests, and actually superior in certain forms of mathematical ability. These results are certainly striking and only emphasize the fact that the problem is not one which can be solved offhand.

Even when dealing with such a group as the Negroes in the United States we cannot be too triumphant in the claim that here at least there is no language handicap and so results must be accepted as they stand. We must bear in mind that the I.Q. is essentially a function of school experience. Gordon in his work on the Canal Boat Children proved that point. The I.Q.'s can only be compared when schools are giving equal opportunities and we doubt if the Southern Negro school would be placed on an equality with the Northern white school by any educator familiar with the facts. It is interesting to note that in the army tests the Northern Negro was superior to the Southern white in some cases. We do not hear that rather significant point emphasized by our Nordic enthusiasts.

We look forward with interest to the International Intelligence Test now being tried out under the supervision of Professor Brigham. This, we feel, is a step in the right direction, since it is entirely non-linguistic. We say advisedly, a step, not a solution of the problem. So far as we are aware, this test is not being used in conjunction with the taking of exact anthropometric measurements by trained observers and until this is done we shall have that fundamental objection, that the work is largely on a national basis and that at best the psychologist can only say that "probably" such and such a group belong "mostly" to the Mongolian or Negro or Alpine race.

The point at issue is not essentially one for the psychologist to decide. To be sure, he should be our last authority on the subject of tests for intelligence, but he is liable to overlook many vital points unless he considers the opinion of the anthropologist and biologist as well. For instance, is the physical inferiority of the French-Canadian, so well illustrated by Davenport, due to the fact that the stock is just poor or is it due to inbreeding?

If the latter, then the defects, mental and physical, can and probably will be rapidly remedied as soon as intermixture becomes more the rule—but it is a question whose final answer seems outside the realm of the psychologist.

Or again, why the decline of Greek civilization? Mixing with poor stock, perhaps. Just as good a guess would be malaria, or plague, the killing off of the educated in warfare—witness the Athenian disaster at Syracuse—or race suicide. After all, we cannot call the Indian or Eskimo *inferior* because he happens to have no resistance to smallpox or tuberculosis. The fact is, he has not had a chance to demonstrate. Cortez crushed the Aztec as much with smallpox as with steel. Had the Spaniards been met by a race capable of combating them and of absorbing their civilization, who can doubt that the Mexican would today have been in much the same position as Japan?

Indeed, it would seem that the historical solution of the problem was just as truly scientific as can be any attempt with our present-day intelligence tests. Again and again we have the case of a race or nation being the despised outcast or barbarian one generation and demonstrating that it is capable of high culture the next. The Aztec, the Jap, and even the North European himself have all passed through this stage. In psychology we say of the individual that past achievement is a guarantee of future attainment. Surely this must apply to some extent to nations and races, and for one race to assume superiority merely because at present it can lodge a fair argument to uphold that claim would seem a trifle unreasonable.

In conclusion might I state my conviction that as yet we have not even approached a scientific proof of superiority of one race over another in intellectual attainments. The problem is immensely complex and is one on which the anthropologist and biologist have really as authoritative an opinion as the psychologist. Tests must be used in conjunction with exact anthropometric measurements, language handicaps must be done away with, and even then we have the well-nigh hopeless problem of culture background. Will authorities agree that any test, non-linguistic or otherwise, can be prepared by the American and legitimately

used to gauge the intelligence of the Chinese? I think not. In an article of mine which has just appeared[1] I have tried to meet this final objection—unsuccessfully, I fear.

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[1] A Proposed Technique for Determining Racial Differences in Intelligence. Amer. Naturalist, Jan.–Feb., 1928.

A PREHISTORIC SKELETON FROM GRASSY ISLAND

By EDMUND BURKE DELABARRE

IN THE AMERICAN ANTHROPOLOGIST, n.s, 27: 359, 1925, I described the discovery of relics of Indian occupation on a site whose location gives evidence that it was used as an encampment many centuries ago. The stratum on which the artifacts occur lies now underneath three feet or more of peat at Grassy island, in the Taunton river in Massachusetts, and is covered by high tides to a depth sometimes of seven or eight feet. As nearly as can be calculated, the things found at that now submerged level must have been left there at least a thousand years ago,—probably fifteen hundred years would be an even more reasonable estimate. Confirmation of the presence of Indians in New England at that remote period, and of subsequent subsidence below sea-level of the ground on which they lived, has been submitted recently by C. C. Willoughby, in an article describing "An Ancient Fish-Weir" (AMERICAN ANTHROPOLOGIST, n.s., 29: 105, 1927).

On May 21, 1927, I uncovered at Grassy island the fragmentary remains of one of the natives who lived there at the time when the implement-bearing surface was a habitable site. The deposit presents several features of particular interest, some of which are of a distinctly puzzling character. At first sight, I attached little importance to it, not suspecting its human character. Consequently, while I made reliable observations of its appearance, dimensions, and situation, I did not take care to collect and preserve every fragment. Later, on learning that the bones were human, I recovered as many additional fragments as possible from the beach, where they had been washed about by intervening tides. Some few bones of an entirely different and recent non-human source may possibly have been lying unnoticed on the beach nearby, although I had seen none and had made a very thorough examination of the beach before excavation began. What may be relied upon therefore in this account is first the accuracy of description of the character of the deposit and its

surroundings; second, the fact that most of the bones collected, including all that are human, came from that deposit; and third, that practically all the contents of the deposit were eventually assembled except such as were too small to pick up. It is not impossible, though hardly likely, that at most one or two small bones from some other source may have been included among those collected. For estimates as to the significance of these remains I have had to rely upon persons having better knowledge of such matters than I myself possess, and I have obtained from them opinions which are not wholly in agreement with one another.

The line of demarcation between the overlying peat-growth and the ancient habitable surface is clearly marked. The bones were found ten inches underneath this ancient surface. They were lying all together in a small mass, somewhat disk-shaped, one to two inches in vertical thickness and ten to twelve inches in diameter. They were broken into small fragments, varying in size from the merest speck up to not more than two inches in longest dimension. There were hundreds of these fragments crowded compactly and confusedly together, with the interstices between them filled with soil exactly like that of the ground around them. There was no evidence of ashes, charcoal, or any substance other than bone and soil; and no sign of a container, although there may have been one originally, of a perishable character. It was a sharply defined and isolated deposit. I have dug in all directions beyond it, excavating a half-oval area of about 75 square feet to a distance of six to twelve feet from the location of the bones, and have found nothing further that contributes to a solution of the nature of the deposit. There were only a few arrowheads, finished and unfinished, at various depths, and a possible stone hoe. Some of the most interesting of my previous finds, however, had been only a short distance away,—the shallow mortar, gouge stuck upright in the soil, graphite and red ochre, and the hearth-like arrangement of stones, were within twenty feet of one another, and ten to twenty-five feet from the bones.

Many of the bones show a checking, such as may have been due perhaps to long exposure to weathering, or perhaps to the

action of fire. Otherwise, they appear to be unaltered. They are in such small fragments that it is difficult to identify many of them. There is no question however that most of them are human. There appear to be among them recognizable fragments from arm, leg, and foot, and there are certainly many fragments from the human skull. Of the latter, Professor H. H. Wilder writes:

> The edges show sutures, which are those of an adult and are not senile.

There are not enough of them, nor in large enough pieces, to permit reconstruction of the skull and determination of its characteristics. This has been attempted, but fruitlessly, at the American Museum of Natural History. Furthermore, of other parts also there is certainly very much less than a complete skeleton represented. Says Wilder:

> The spectacular point is the complete absence of teeth, the hardest part of a skeleton. Even after cremation they could not have become lost when the other bones were kept.

Many other portions of the skeleton must be absent also, as is evidenced by the small size of the collection, whose clear-cut margins and solid, compact character make it seem that what was found was all there was to the original deposit. This constitutes one of the puzzles of the situation. So also does the fact that not all of the bones are human. Wilder writes:

> It is also certain that there are bones of other animals, probably mammals and birds. Among them I have noted the base of a scapula from an animal the size of a cat, perhaps a woodchuck or rabbit.

Barnum Brown reads the evidence of the skull-bones as indicating a younger person than Wilder supposes, and disagrees with the latter's identification of animal bones. But he too finds one bone, a vertebra, that is not human.

It is clear that these remains cannot have been the result of a burial made on the spot within historic times. Grassy island is known to have been at practically its present level in the earliest Colonial days. No one would have dug for such a purpose through four feet of peat and soil on an island submerged at every high tide. The remains must date from the time when the ancient surface now underneath the island was above water and habitable. Aside from this, nothing seems sure about the

origin of the deposit. Barnum Brown assures me that the checked appearance of the bones is a result of long weathering on the surface of the ground. On the other hand, Mr. Willoughby tells me about the human bones:

> They are undoubtedly what remains of a cremated human body. We find very rarely in New England what may have been the remains of a burnt prisoner of war or something of that nature. I know of only two or three such instances.

No hypothesis appears to account easily for all of the features connected with the case. Why should there be only parts of a human skeleton, mingled probably with a few animal bones, lying in a small compact mass? The only suggestions that have occurred to me, and to others whom I have consulted, are the following:

1. Portion of a kitchen midden. This seems practically impossible, for a good many features are absent that would have been surely present in such a case: more numerous and varied food-remnants of bone and shell spread over a wider and thicker area, shards of broken pottery, artifacts.

2. Remains of a prisoner burnt at the stake. It would have to be assumed that the bones were left where they fell in a compact heap, that animals were thrown into the same fire, and that some bones crumbled and disappeared. This supposition, unless merged with the next one, is hard to reconcile with the sharp delimitation of the mass, and with the absence of so much of the skeleton.

3. The burial of a cremated body in some perishable container, perhaps with the inclusion of small animals to serve as food for the departed spirit. This theory is plausible, but does not account fully for the missing parts of the skeleton. It is true however that in some known cases of cremation no great care seems to have been taken to gather up every fragment of the remains.

4. The stomach-contents of a carnivore, such as a wolf. This supposition demands the assumption that a wolf, possibly some time after a meal of small animals, came upon a human body, probably with crushed skull; gnawed portions of the body, from both extremities; was himself killed shortly afterwards and disemboweled, the body being disposed of otherwise but the stomach

thrown into the fire. Or, alternatively, the human body might have been partially burnt beforehand, through accident or design, and the wolf's stomach simply thrown away to decay where it fell. This series of events is not wholly impossible. The disagreements of opinion of which I have spoken make two simplifications of this hypothesis possible: first, the feature of fire may be dispensed with, if the condition of the bones was due to weathering instead of cremation; and second, the small animals need not be assumed if the vertebra is the only non-human bone present, because a single bone like that might have crept inadvertently into the collection in the manner already suggested.

5. Contents of a medicine-bag. All sorts of curious things went into such bags, and this suggestion by Mr. Willoughby deserves consideration.

None of these possibilities seems wholly convincing, and the exact nature of the original incident remains a mystery. Nevertheless, we may be sure that, however he may have perished and however the compact assemblage of an incomplete and finely fragmented collection of his bones may have come about, these bones are certainly those of an Indian who lived in Massachusetts not less than ten to fifteen hundred years ago.

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EDWARD SANDFORD BURGESS

IN Professor Edward Sandford Burgess, whose death occurred on February 23, 1928, we mourn one of the founders of the American Anthropological Association. A son of Reverend Chalon S. Burgess and a grandson of Dr. Jacob Burgess, who moved from Berkshire county, Massachusetts, to Silver Creek, New York, in 1811, he was born on January 19, 1855, in Little Valley, Cattaraugus county, New York. He was graduated from the State Normal School of Fredonia and in 1879, with distinction, from Hamilton College; and for two years he held a graduate fellowship in Greek at Johns Hopkins under Dr. Gildersleeve. However, his taste for natural science came to predominate over classical leanings, and he chose the teaching of science for his life work, with botany and anthropology as his major interests. For thirteen years he was Professor of Botany in the Central High School of Washington, D. C., and, during the same period, at Martha's Vineyard Summer Institute. In 1885 he taught at Johns Hopkins, and in 1895 was called to the professorship in Biological Sciences at Hunter (originally Normal) College, New York City, where he became a teacher of science teachers.

It is not generally known that Dr. Burgess was one of the first, if not the first, to introduce regular instruction in anthropology in a college for women. He organized a collection for teaching purposes, stimulated visits to the museum exhibits available in the city, and encouraged his assistants to take up graduate work in anthropology. In 1925, before his retirement, six courses were offered by the Biology department, those on Primitive Man, Language and Race, and Prehistoric Man being prescribed for all majors. The first of these, prerequisite to the rest, dealt with general principles, the illustrations being mainly drawn from American Indian life. A fourth course on Primitive Civilization varied in subject-matter: it was devoted either to the higher civilization of the Near Orient or to Neolithic man and early social and religious institutions. The two remaining courses treated, respectively, Primitive Mediterranean Civilization, with the

emphasis on Crete; and the Ethnology and Culture of China and Japan. Endowed with an unusually sympathetic outlook on human problems, Dr. Burgess considered it a vital task to instill into the rising generation liberal views as to the racial strains that meet in New York City.

Primarily interested in botany, Professor Burgess' major publications were in that field—the *History of Pre-Clusian Botany* being published in 1902 and *Species and Variations of Biotian Asters* in 1906. However, with advancing years his attachment to our science deepened. Besides studying the Romantsch people of southeastern Switzerland, gathering fragments of American Indian lore, and accumulating specimens of primitive craftsmanship, he wrote a comprehensive work on Palaeolithic man, which, it is hoped, will be published. It discusses the geological and palaeontological background of man's evolution, early fossil types, and the cultural stages down to the Campignian and the Danish kitchen-middens. Cognizance is taken of W. K. Gregory's and Elliot Smith's studies on the biological side, while culturally there is consideration of the Eolithic, with attention to the rostro-carinates.[1]

Professor Burgess' personality represented a felicitous blend of scholarly devotion and character. He was a modest student of the universe, with a loving absorption in all its manifestations that might well arouse the emulation of the younger generation. No one privileged to see his travel notebooks could doubt that he had the gifts of a first-rate recorder of ethnographic fact. With his omnivorous tastes, and his powers of observation he recalled the great British naturalists of an earlier period. He suggested them also by the noble simplicity of his character, the wholly disinterested devotion to his ideals. Those who knew him will remember him.

ROBERT H. LOWIE

[1] For the description of this work, as well as for other details, the writer is indebted to Mrs. Edward Sandford Burgess and Miss Julia Burgess.

BOOK REVIEWS

ASIA

Bei den Urwaldzwergen von Malaya. PAUL SCHEBESTA. (Leipzig: F. A. Brockhaus, 1927. 278 pp., 150 ills., mostly photographs, 1 map.)

Father Schmidt's enthusiasm for the investigation of Pygmy peoples induced Pope Pius XI to finance an expedition to the Malay peninsula for ethnographic research among the Semang, Sakai, and Jakudn. The task of conducting the researches was entrusted to Father Schebesta, one of Professor Schmidt's disciples, and the present volume embodies a travel report and popular ethnographic account, limited however to the Negrito visited, the description of the other tribes being reserved for the future.

Like the Andamanese, the Semang represent not a single linguistic or cultural, let alone a political, unit but a number of distinct, though related, groups, the northernmost living in Siam in isolation from the rest. The total number is set at 2,000, of whom the Djahai, who occupy part of northeastern Perak and western Kelantan, constitute about forty percent (p. 13). In various localities there has been intermarriage with the Sakai (p. 39), and throughout the peninsula characteristic relations obtain between the Negrito and the Malays. Each Semang group has as quasi-guardian some one Malay, to whom they bring the produce of their forests in exchange for rice, iron knives, or cloth. As a lower caste, they are not permitted to enter a Malay hut, and they suffer considerable exploitation (pp. 29, 38). Though nowadays no Malay would dream of marrying a Negrito, miscegenation has undoubtedly occurred even in fairly recent times (p. 37).

Contact with the Malays naturally affected the Negrito mode of life. It is surprising, however, that the bow is universally obsolescent, having been superseded by the blow-gun (pp. 48, 73, 189). Some groups have become passionate betel-chewers (p. 232), and sporadically disease is treated by the exorcism of the possessing spirits, the formulae used being in Malay (pp. 134, 187). The as yet quite rudimentary attempts at cultivation of the soil are of course traceable to the Malays (p. 269f.), and the same applies to masculine dancing, all old Semang dances being executed only by

women, while the men provide the music (pp. 32, 68). It occurs to the reviewer that the occasional mention of seven as a ceremonial number suggests influence from the same source. For example, the Menri Semang avoid approaching the site of a grave for seven days; while the Kenta observe restrictions for seven days after the decease and have funeral feasts on the seventh, fourteenth, and twenty-first days (pp. 265, 227).

The Semang are mainly vegetarians, the women largely but not wholly devoting themselves to the required gathering of food (p. 269). A simple wind-screen forms the regular dwelling (p. 52); and all utensils, such as water-containers and cooking-vessels, are of bamboo (pp. 22, 270). The preparation of poisonous roots is a noteworthy feature (p. 111). Father Schebesta is thus led to speak of his Pygmies as living in a Bamboo Age, left untouched by the Stone Age (p. 151). While, of course, the fact that stone implements are lacking—notwithstanding the availability of the raw material—is significant, it seems more plausible to assume that the ancestral Semang merely discarded what stone tools they once possessed in favor of bamboo.

Though the author sometimes speaks of "*Sippen*," he tells us explicitly that the social unit is the family and that "*jede straffe Stammesorganisation*" is lacking (p. 270). This is in harmony with the kinship nomenclature (p. 108f.). Thus äi is father; äi-toi, parent's elder brother; äi–bä, parent's younger brother; bö, mother; bö–toi, parent's elder sister; mo, parent's younger sister. Personal names are never used in address, either kinship or status terms being substituted. The type of distinction recognized may be illustrated by the words "mawogn" and "bakes," of which the former designates persons having three children, and the latter those having more than three. Though the data are not given in full, they demonstrate a non-bifurcating system with Hawaiian leanings modified by a tendency to discriminate between the collateral relatives and those of the direct line of descent. When the complete terminology is known, it will be profitable to compare the details with the Andamanese system.

Marriage between cousins is forbidden; also, specifically, between a man and his "mo." The smallness of each territorial group thus promotes practical local exogamy (pp. 92f., 109, 173, 225). Polygyny is not prohibited, but rare; on the other hand, divorce is common, though not after the birth of children (pp. 93f., 271). Marriage with the deceased wife's sister is attested in at least one case (pp. 59, 67). A form of matrilocal residence occurs, inasmuch as

a Semang bridegroom will remain near the father-in-law for two years in order to work for him, after which period he goes to join his own father for good (p. 92). The husband presents his prospective father-in-law with gifts, which are returned if the wife seeks a divorce but not in the reverse case (pp. 93, 225). Rules of avoidance are strictly maintained; a father must not sleep near his adult daughter, nor a mother near her adult son (p. 183), who may or may not sleep with other youths in a sort of bachelors' hut (p. 54). By far the most striking kinship taboo, however, is that between child-in-law and parent-in-law of the opposite sex (pp. 63, 184, 215, 224). They are not allowed to speak or even approach each other; a son-in-law would rather allow his wife's mother to drown than touch her. The observance is derived from the supreme deity, and any breach would precipitate a fatal illness.

Property rights are most conspicuous as regards the durian and the ipoh (poison) trees. Wherever a group owns trees, there is its home, and no one would encroach on these rights so long as the fruit is on the tree. The Semang is generous towards his own and related families, but unrelated ones are treated at best in niggardly fashion (p. 78f.).

The supreme being, Karei, or Kaei, is associated with the thunder, and any transgression of his laws at once provokes a peal of thunder. A list of his commandments includes a prohibition of adultery, of mocking certain species of animals, of killing others sacred to Kaei, of cohabiting in the daytime, of playing with birds' eggs, etc. (214f.). In many cases the god's anger is assuaged by an expiatory blood-sacrifice, the natives gashing their shinbones and casting the blood towards the sky, a rite repeatedly witnessed by Father Schebesta (pp. 83, 150, 177, 191, 262). The other prominent ceremony is the Pano, which is performed mainly as a curative rite. The shaman and his apprentice resort to a special conical hut and hold communion with the Cenoi, fairies who normally dwell in flowers. The Cenoi, in fact, enter the sacred hut and speak through the shamans in an esoteric tongue (pp. 215–219). It is only through the shaman that the Semang can come into relations with the supernatural world. The shaman is a son of Kaei, and after death turns into a tiger. He derives his power largely from a quartz crystal that, mirror-fashion, reveals the nature of the disease threatening a patient. Lesser doctors are mere diagnosticians; the greater ones also prescribe suitable remedies (pp. 181, 185, 219f., 265). Initiation rites are lacking (p. 226).

The relations of Karei (Kaei) to other supernatural beings vary somewhat among different groups. Sometimes his son Ta Pedn, though of inferior power, figures as the benevolent creator and intercessor between man and Karei (p. 178f.). Myths are not dealt with *in extenso;* the world-conflagration motive (p. 84) and the pursuit of the (male) moon by the (female) sun (p. 101) may be mentioned. The Kenta Semang believe in a primeval flood, from whose depths the dung-beetle brings a small lump of earth, which rapidly grows in height (p. 212). From the same group is reported an unusually systematic and complex cosmology (pp. 208 sq.).

Disposal of the dead is by interment, a wind-break being erected above the grave (p. 135 sp.). The spirits are conjured to remain away and not cause illness in the camp, but fear of the dead leads to the abandonment of the settlement (p. 140). Schebesta does not confirm Stevens' report of a soul-bird except as a Malay concept (p. 95). The Semang have, of course, a belief in a dream-soul, which separates from the body during sleep and may suffer harm in the course of its travels (p. 140).

The Semang do not tattoo, and rarely paint their bodies. On the other hand, bamboo utensils, viz., the blow-gun, quiver, and comb, are beautifully decorated. The author, however, found the ornamentation lacking in the extreme north and south and considers it of alien origin. For the most part, the designs are of merely decorative nature, but the Kensiu-Kenta division attaches magical significance to some of the patterns (p. 250f.).

Enough has been said to prove the value of Father Schebesta's book, which also succeeds in conveying the atmosphere of travel in the Malay peninsula. Ethnographers will look forward with great anticipation both to the fuller monograph on the Semang, and the description to be devoted to their neighbors.

ROBERT H. LOWIE

Ceylon Journal of Science. Section G.—Archaeology, Ethnology, Etc. Edited by A. M. HOCART, Archaeological Commissioner, Ceylon. Volume 1, part 2. October 1st, 1925. (London: Dulau & Co., Ltd., 34, Margaret St., Cavendish Sq., W. 1. Ceylon: The Archaeological Commissioner. Price Rs. 3–50.)

The second number of this new anthropological journal has made its appearance. The excellence of its typography and the fine series of half tone plates and drawings make it a most pleasing number.

The intrinsic interest of the subject matter appearing in this journal should insure for it a wide range of subscribers.

In the present number there are three articles by the archaeological commissioner of Ceylon, Captain A. M. Hocart. The first article is an "Archaeological Summary" of exploration in Ceylon. This is illustrated by thirty fine plates and maps, and covers a wide range of archaeological features from chipped chert implements to cave temples.

The second article is one of great general interest to students of human culture, for it deals with India and the Pacific. The author, with characteristic acumen, traces to a pre-Vedic source the social organization of eastern Fiji. His knowledge of both ancient Indian literature and modern Oceanic culture gives him an unusual vantage ground from which to discern the connections between the geographically remote regions of Fiji and India.

"Money" is the title of the third article. Therein the author identifies the parent form of all money with the fee paid to the priest who conducts a sacrifice.

Not only is the Ceylon Journal of Science purchasable from Dulau and Company, but it may also be obtained by exchange. All communications should be addressed to the Archaeological Commissioner, Ceylon.

E. W. GIFFORD

The Yukaghir and the Yukaghirized Tungus. (The Jesup North Pacific Expedition, 9: 343–469.) WALDEMAR JOCHELSON. (Leiden: E. J. Brill, Ltd., 1926. 15 guilders.)

The present installment of Dr. Jochelson's monograph is devoted to the material culture of the Yukaghir. Like its author's previous publications it is full of ethnographically significant matter, from which it is hard to make adequate selections.

In the description of Dwellings, the similarity of the conical skin-covered tents to those of northern Canada is striking (pls. 19, 20). This is not the only type, however, there being also, on the tundra, cylindrical tents merely topped with a cone (p. 346, pl. 20). Remnants of wholly or partly underground houses were reported in the eighteenth century, but these earth-lodges disappeared long ago (p. 346 f.).

Dogs are not used for driving except by a small portion of the Yukaghir. Except for infants and invalids, only freight is trans-

ported on dog-sledges, women and girls being sometimes harnessed in order to aid the animals (pp. 349–351). While the Yassachnaya and Korkodon Yukaghir have only dogs, the Tundra people have small reindeer herds, averaging from eight to fifteen head. The Tungusized Yukaghir, however, have as many as 800 and more. The Yukaghir harness their reindeer to sledges of the Chukchi-Koryak type, which are straddled by the driver. They also ride their beasts in the summer time, laying the saddle above the reindeer's forelegs, since otherwise a heavy rider might break its back. Jochelson distinguishes the short Chukchi-Koryak mountain reindeer breed as unfit for a mount, being innately quite different from the Tungus-Lamut tundra variety. From this he infers the separateness of their origin (p. 368). The best breed of the East Siberian area is that of the Yakut, who, although they only recently got reindeer from the Tungus, "applied to their reindeer herds the methods of conscious selection with which they were familiar as horse and cattle breeders" (p. 363).

Dr. Jochelson quotes an interesting survey of reindeer-breeding by a Russian veterinary, Dr. Kertzelly, who in addition to the universally recognized nomadic category defines a second type, that of the house or farm reindeer: scores of reindeer or lesser numbers are kept near the dwellings (p. 361) in an enclosure and fed on hay and lichens gathered during the summer. Jochelson infers that

> the concept of the reindeer as inherently a migratory animal that could never thrive in an enclosure may be radically changed after observation of the "settled" reindeer household (p. 367).

This form of reindeer-breeding occurs among the Yakut, the Ostyak, and Russian peasants of Arkhangelsk, and Vologda.

As to the origin of reindeer domestication, Jochelson holds with Bogoras that it is very ancient and occurred independently in several centers. He thus rejects Laufer's and Hatt's views and, as regards the first point, finds himself in agreement with Schmidt and Koppers. While the reviewer does not consider himself able to arrive at a positive judgment on this moot-point, he would like to point out that "independent origin" admits of two meanings. If Lapp reindeer-breeding has nothing to do with that of the Samoyed, this does not prove that the *idea* of domestication was created by them independently of Scandinavian example. Or would Dr. Jochelson hold that the yak, the buffalo, and our cattle were all domesticated by three peoples in complete ignorance of one another's methods? Similarly,

the Chuckchi may not have acquired individual reindeer from the Tungus, but surely the notion of rearing these animals came to them from the outside. Domestication is far too artificial and difficult a phenomenon to permit an indefinite number of successful separate inventions of the process.

Unfortunately in the midst of his valuable discussion of reindeer-breeding Dr. Jochelson makes the erroneous statement that the domestic horse was known in the oldest Neolithic period of Europe (p. 363). There seems to be no basis for the occurrence of the domesticated horse until very much later.

It should be noted that the Yukaghir are essentially fishermen, since their reindeer are too few to supply the staff of life (p. 370).

The Yukaghir have generally adopted Tungus costume, which the author notes as irrational borrowing inasmuch as the Tungus dress is ill-adapted to the rigorous climate of the far north—less so than the older Yukaghir style which followed the Chukchi pattern (p. 388). In the treatment of snow-goggles Dr. Jochelson's antidiffusionist bias reappears.

> Painful snow-blindness is the result of not using snow-goggles. They must, therefore, be an independent invention of the circumpolar peoples (p. 398).

But in northern Canada we find that only those Athabaskans in contact with the Eskimo have taken up with the idea of snow-goggles. (A. G. Morice, The Canadian Dénés. Ann. Arch. Rep. 1905, Toronto, 1906, 198.)

The Yukaghir learnt to work iron from Yakut blacksmiths in the seventeenth century. However, even before that time there were few stone implements, bone being more prominent. Thus, lances and knives were of elk ribs, arrowheads of mammoth tusks (p. 423).

The last chapter, on Art and Pictographic Writing, is full of suggestive matter. The Yukaghir share the Eskimo propensity for mapping.

> In their drawings they display a clear conception of the relative location of the rivers, lakes, and mountains of the territory they know and also a knowledge of the four cardinal points (p. 444).

The love letters scratched on birchbark by young girls by a series of conventional symbols are likewise of the greatest psychological interest (pp. 444–450).

American anthropologists must be profoundly grateful for having Dr. Jochelson's researches once more made accessible to them in their

own tongue. In the near future we hope to report on his study of Yukaghir religion.

ROBERT H. LOWIE

The Reindeer-breeding of the Karagas. B. E. PETRI. (Irkutsk, 1927. In Russian. 46 pp.)

Although the title of this pamphlet mentions only the Karagas, it includes also a description of the reindeer-breeding of the Uriankhai people or Soyot. The pamphlet exhibits a double interest. First, it positively decides the question of the identity of the Uriankhaitzy and the Soyot. The late Dr. Weule (*Leitfaden der Völkerkunde*, 5) regards the Soyot and Uriankhai as different tribes. The late Miss Czaplicka expressed her doubts whether the Uriankhaitzy and the Soyot are one and the same tribe. She says (*The Turks of Central Asia in History and at the Present Day*, 59):

> The Uriankhai are sometimes called Soyot, but it is not certain whether this name ought to be applied to all of them.

Second, Petri gives data on the mode of reindeer-breeding among the Karagas and Soyot. The use of the reindeer as a mount and pack-animal by these two tribes differs from other reindeer-riders of Eurasia. Professor Petri wrote to me before starting to the Sayan mountains, and I suggested to him to give his attention to the two questions mentioned. The pamphlet answers them.

The reindeer of the Soyot and Karagas belong to a strong, tall, and highly domesticated race. As mountainous tribes they use the reindeer as a riding-animal only. All other reindeer-riders of Eurasia sit over the front legs of the animal near the neck, on a saddle without stirrups; the rider is balancing in his seat and keeps in one hand a long staff to lean upon. The northern reindeer is too weak to hold on his back a grown-up rider. The Karagas and Soyot sit on the middle of the reindeer's back as on horses. It must be mentioned here that the Soyot who live in Mongolia rear cattle and horses instead of reindeer.

Castren regarded the Karagas and Soyot as Turkicized Samoyedic tribes. They call themselves Tuba. In the Chinese annals the name Tuba is applied to peoples who lived in the southern Yenisei region and it is probable that Samoyedic tribes were meant. The Turkic peoples were called Tu-kiu. Patkanoff believes the name Tuba to be testimony in favor of their Samoyedic origin. The reindeer-breeding of the Karagas and Soyot gives further evidence of their Samoyedic origin.

A few words more on the Karagas. At present they form a poor, declining small tribe, numbering 416. They depend in their household upon the Soyot, from whom they acquire reindeer, upon the Buryat who sell them horses, and on Russian merchants and Soviet officials. What they need is a disinterested support of their economic life.

WALDEMAR JOCHELSON

PHYSICAL ANTHROPOLOGY

The Racial Characters of the Swedish Nation. Anthropologia Suecica MCMXXVI. Edited by H. Lundborg and F. J. Linders. (Published by the Swedish State Institute for Race Biology, Uppsala, 1926. Pp. I-XIV, 1–182, 1*–108*, pls. 1–44, whole page maps 1–4.)

This is a monumental work, prepared through the collaboration of the staff of the Swedish State Institute for Race Biology and edited by Doctors Lundborg and Linders. The collection of the material was made chiefly during the years 1922–24. The subjects of the investigation were 47,387 soldiers between the ages of twenty and twenty-two years, thus representing a selection with regard to certain characters, notably stature. In the plates of types, older men, women, and children are also represented. The anthropometric material is presented, with due regard to locality and social status, through the medium of twenty-six tables. No series of individual measurements is given, except of individuals portrayed in the plates.

The whole-page maps are in colors and show, for northwestern Europe, (1) mean stature, (2) eye color, (3) head form, and (4) the Nordic racial kernel areas. The pronounced Nordic racial kernel areas lie in the broadest part of the Scandinavian peninsula and in Iceland. In the kernel areas more than eighty percent of the population have cephalic index below 80, more than ninety-five percent have blue, gray, and mixed eyes, and men have a mean stature of 172 to 174 centimeters. The agricultural population shows on the whole a more Nordic character than the urban and industrial populations (p. 179).

A summary occupies pages 172 to 182 and presents in very convenient form the outstanding features of the sections by the various authors. Certain of the conclusions are of sufficient general interest to cite in even so brief a notice as this.

Docent G. Ekholm, of Uppsala, writes that

the Nordic race must be considered as having developed from the Aurignac race, which is thought to have migrated from Asia (p. 173).

Two fair-haired, blue-eyed races are recognized: (1) the tall Nordic race with a long, narrow face and long, narrow head; (2) the medium-sized, thick-set, East Baltic race with a broad face and broad head. The Swedish nation today contains a higher percentage of the Nordic race than any other people in the world. The number of dolichocephals in Sweden is greater than in any other Nordic country (p. 182).

Concerning the "Cro-Magnon race," the following sums up the opinion:

> Both a critical study of the abundant literature on this subject and our own observations have strengthened us in the opinion that in all probability no *homogeneous* "Cro-Magnon race" has existed, but that the rather varied types which have been called so, cannot for the present be considered anything but crosses arising from the mixture of different races in accordance with the Mendelian laws (p. 175).

In the time that has elapsed since the measurements were made for the Anthropologia Suecica of 1902, stature has increased thirteen millimeters, and an increase is found in all the provinces of Sweden (p. 176). Cephalic index has decreased from 78.1 in 1902 to 77.7 in 1926.

Cephalic index and morphological face index vary geographically, but remain constant throughout different professional groups and social strata. Stature is greatest in the towns, smaller in the agricultural communities, and smallest in the industrial communities. Persons belonging to the highest social stratum are taller than those belonging to the intermediate stratum, and these in turn are taller than those belonging to the lowest stratum. There is no occasion to doubt that these variations in stature cannot be explained by differences in milieu alone, but depend also on differing racial composition in the respective groups of population (p. 179).

A very close connection exists between eye color and hair colors. The hair color which most closely follows the color of the iris is the eyebrow color, after which comes the pubic hair, and last the head hair. Red hair color when correlated to eye color seems to show the same relations as light brown hair (p. 180).

Northernmost and southernmost Sweden, as well as the city of Stockholm, have the greatest proportion of brown-eyed persons (p. 175).

For the entire kingdom the frequency of the Purer Nordic type is 30.8 percent, of the Purer East Baltic type 8.7 percent, of the light mixed type (individuals with light eyes and light head hair other than Purer Nordic and Purer East Baltic) 27.1 percent. This makes 66.6 of the population light eyed and light-haired (p. 181).

As the editors clearly recognize, the work leaves many problems unsolved, which it is planned to elucidate in the future. It is to be hoped, too, that the individual measurements will be made available.

The enlightened example of the Swedish government in establishing the Swedish State Institute for Race Biology is one which other nations would do well to follow. The usefulness of such an institution was so well realized in Sweden that the Riksdag gave assent to its establishment without voting, on May 13, 1921.

Although written in English this splendid work was published in Sweden, being printed by Almquist and Wiksell Printing Company, Limited. It sets a high book-making standard in every respect that a scientific book should and contrasts with the all-too-frequent careless contemporary scientific productions in English-speaking countries.

E. W. GIFFORD

MISCELLANEOUS

In Commemoration of M. A. Castren on the 75th Year from his Death. (Published by the Academy of Sciences, Leningrad, 1927. Pp. 1–141. In Russian.)

The great Finnish linguist, Matthias Alexander Castren, was born in Finland, December 2, 1813, and died May 7, 1852. He did not reach the age of forty by one and a half years. His first article (on the Kalevala) appeared in the "Helsingfors Morgonblad" of December, 1836, and thus the whole cycle of his scientific investigations and writings embraces a period of only sixteen years. It is almost unbelievable to conceive how many journeys he undertook and what a number of investigations he accomplished in such a short time.

He investigated twenty languages, with many dialects, which nobody had studied before him. The monumental series of his chief publications, under the editorship of the Russian academician, A. Schiefner, includes twelve volumes under the title of *Nordische Reisen und Forschungen* as follows:

I. Reiseerinnerungen aus den Jahren 1838–1844.
II. Reiseberichte und Briefe aus den Jahren 1845–1849.

III. Vorlesungen über die Finnische Mythologie.
IV. Ethnologische Vorlesungen über die Altaischen Völkerschaften.
V. Kleinere Schriften.
VI. Versuch einer Ostjakischen Sprachlehre (two editions).
VII. Grammatik der Samojedischen Sprachen.
VIII. Wörterverzeichnisse aus den Samojedischen Sprachen.
IX. Grundzüge einer Tungusischen Sprachlehre.
X. Versuch einer Burjatischen Sprachlehre.
XI. Versuch einer Koibalischen and Karagassischen Sprachlehre.
XII. Versuch einer Jenissei-Ostjakischen and Kottischen Sprachlehre.

The book comprises ten articles by noted Russian linguists, philologists, ethnographers, and anthropologists:

1. Introduction, by S. F. Oldenburg, the Permanent Secretary of the Russian Academy of Sciences.
2. Castren as a Man and Scholar, by W. G. Bogoras.
3. Castren, the Altaiologist and Ethnographer, by L. J. Sternberg.
4. Castren, the Finnologist, by D. W. Bubrich.
5. Castren, the Investigator of the Samoyed, by N. N. Poppe.
6. Castren, the Turkologist, by A. N. Samoilovich.
7. Castren, the Mongologist, by B. J. Vladimirtzev.
8. Castren, the Investigator of the Palae-Asiatics, by W. G. Bogoras.
9. Castren, the Tungusologist, by J. P. Koshkin.
10. Bibliographical Materials, by L. B. Modsalevsky.

Each of these authors gives an impressive characterization of Castren as a man, scholar, traveler, investigator, and writer. Castren was a penetrating thinker. In the determination of sounds of recordless languages he anticipated the methods of the present phonetics. He laid the foundation for the study of the "Mongoloid" languages. He demonstrated the relation of Finno-Samoyedic languages with the languages of the Turks, Mongols, and Tungus. He tried to bridge also the gap between the Mongoloids and Palae-Asiatics (or "Americanoids" in the writer's terminology) through the Yeniseians, and it remained only to extend the connections to the languages of the Eskimo and American Indians, which connections are the object of the most recent studies. In the realm of religion he outran Tylor and Spencer, taking the stand of the latest theories concerning magic, shamanism, and religion. Castren formulated long before MacLennan, and more correctly, the institution of exogamy; and as concerns marriage regulations within the clans of the Siberian natives and between the clans he may be regarded as the predecessor of Morgan.

During his long journeys, combined with many hardships and assiduous studies of natives in their unhealthy huts and tents, the

physical organism of Castren gave way. He contracted consumption. He was aware of it, nevertheless he continued his investigations, saying that the highest joy of a man is to offer his life for an idea. And his idea was the study of primitive human companions. He married, however, about a year before his death and shortly before his death a son was born to him. Pausing here, we wish to say that it would be worth while to translate into English this little book on a great man.

In connection with Castren another great name must be mentioned here, that of the honorary member of the Imperial Russian Academy of Sciences, Professor Anton Schiefner, who, neglecting his own scientific work, devoted many years of his life to the scrupulous working out and preparing for the printer of the material collected by Castren. This he did mostly after Castren's death. There remained, however, some material not worked out as yet.

Castren's first records were written in Finnish but he soon adopted the German language, his style being revised by Schiefner. With the Russian language Castren became familiar in Siberia. The members of the Russian Academy of Sciences of that time were mostly Germans, of Germany or of the Russian Baltic provinces, and the publications of the Academy were mainly printed in German. This had its advantage, the publications being accessible to foreign scholars. Many of the German publications of the Russian Academy of Sciences were later translated into Russian, as for instance, Middendorff's, Schrenck's, Dittmar's, and other papers. When Russian scholars became preponderant, the Russian language was adopted, with casual issues in two languages.

WALDEMAR JOCHELSON

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REPORTS

Archaeological Field Work in North America During 1927

Each year the Committee on State Archaeological Surveys of the Division of Anthropology and Psychology of the National Research Council compiles a summary of the archaeological activities of the various state agencies. The work done by them is, however, only a part of all the archaeological investigations conducted in North America. In order to make this annual report more complete, last year the committee invited institutions other than state agencies to participate in this compilation. A similar invitation extended this year met with a whole-hearted response for which the committee desires to express its appreciation. If any organization has been omitted inadvertently, it is hoped that it will communicate with the committee.

At a recent meeting of the committee in Beloit, Wisconsin, it was decided to alter slightly the method of presentation of this report. It was felt that the interests of the reader would be met more adequately by placing under a single head the work done in a given region by all organizations. At present the most practical division of the continent appears to be by governmental units, fully realizing, of course, that neither culture areas nor the work of any one expedition may be confined to a single political unit. So far as possible the various activities have been placed under that heading in which most of the field work was accomplished. To the report proper there has been added an index of the organizations which have cooperated in its compilation, together with the divisions under which their summaries are given.

The function of the Committee on State Archaeological Surveys is to act as a correlating body for archaeological research in North America. It attempts to keep in touch with all work, and so to study and digest this information that it will be able to render assistance and encouragement resulting not only in increased scientific activity, but also in a closer and more serviceable relationship between the many investigators and institutions working in this field. The elimination of duplicate effort and the fostering of cooperative investigations should tend to bring about a more rapid progress toward the solution of the intricate problems which confront the North American archaeologist.

Alabama. Further evidence of the existence of urn-burial as high up the Alabama river as its source has been discovered by members of the Alabama Anthropological Society doing work at the junction of the Coosa and Tallapoosa rivers. Typical examples of urns containing bones of the deceased, which were evidently dried before insertion into the vessel, have been unearthed during the past year.

Village sites have been located on the west bank of the Coosa river in Elmore and Chilton counties. Instances of settlements have heretofore been rare, most of the habitation sites being in the valley east of the river and across the ridge on the Tallapoosa.

A few finds of archaeological objects have been made along the Sipsey river in western Alabama and in the central part of the state on both sides of the Alabama river. Active interest on the part of collectors is shown in the northern part of Baldwin county.

Peter A. Brannon, President,
Alabama Anthropological Society,
Montgomery, Alabama

Alaska. Mr. Henry B. Collins, Jr., Assistant Curator of Ethnology, U. S. National Museum, with Mr. T. Dale Stewart of the Museum staff, carried on anthropological work in southwestern and western Alaska. The greater part of the time was devoted to the large and little-known island of Nunivak, although brief stops were made at a number of native settlements from Bristol bay to the mouth of the Yukon. Skeletal material and measurements on the living were obtained in sufficient numbers to show the physical type of the Eskimo of this region, who are the most primitive and least affected by white contact of any group to be found in Alaska. This work was financed by the Bureau of Ethnology, U. S. National Museum, American Association for the Advancement of Science, and the American Council of Learned Societies. Under a grant from the National Academy of Sciences, Mr. H. W. Krieger of the U. S. National Museum, explored a site at Bonasila on the Yukon on which Dr. Hrdlicka had done work during the preceding season. This site is interesting as it contains skeletal material not hitherto identified in America.

H. W. Dorsey, Chief Clerk,
Smithsonian Institution

Arizona. During 1927, the Arizona State Museum conducted field work in three localities, namely: first, an investigation of the pithouse and late Pueblo ruins along the Gila river between Bylas and San Carlos on the San Carlos Indian reservation; second, a study of the early Pueblo (pithouse) sites and late Pueblo (cliffhouse) sites in the Lukachuka mountains in northeastern Arizona; and third, an examination of the early Pueblo (rectangular pithouse) sites near Tanka Verde mountains in the Santa Cruz valley of southern Arizona. The Department of Archaeology, of the University of Arizona, through its graduate students and seniors, has studied the house structures, pottery, and textiles of the prehistoric Southwest.

Byron Cummings,
Arizona State Museum

Mr. Earl H. Morris made a return visit to Canyons del Muerto and de Chelly to secure a full series of log sections from the ruins previously explored by the Museum under the Ogden Mills Survey. From the study of these log sections by the "tree-ring" method, it is hoped to determine the ages of these ruins.

Clark Wissler,
Department of Anthropology,
American Museum of Natural History

Under a permit granted to the Museum by the Department of the Interior, Mr. Noel Morss made an archaeological reconnaissance of the Moenkopiwash region in Coconino county, Arizona.

C. C. Willoughby, Director,
The Peabody Museum,
Harvard University

Excavations were conducted at the Casa Grande ruin, under government permit, consisting principally of intensive excavation of a burial ground near the main group, and stratigraphic tests in rubbish mounds there and at the Adamsville group, just off the National Monument. The principal result was the establishment of a pottery sequence, an account of which will soon appear as a bulletin of the Museum.

Charles Amsden, Curator,
The Southwest Museum

During the summer of 1927 we visited sixty-seven archaeological sites in New Mexico, Colorado, and Arizona, primarily for the purpose of gathering information concerning prehistoric irrigation. In the area around Phoenix, which we call the culture district of the Lower Salt, there was cultivated by irrigation a continuous, compact body of land of 100,000 acres, and on the Gila, around the Casa Grande ruin, a net area of 15,000 acres. An excavation of the ruin of La Ciudad, on the edge of the city limits of Phoenix, has revealed additional evidence that the culture of the Lower Salt is distinct from that of the pueblo peoples in general, and seems to point clearly to a group migration from the south, presumably from Mexico, at an early period.

Omar A. Turney,
The Turney Museum

California. The field work in archaeology during 1927 consisted of an exploration on Santa Cruz island in the southern part of the state. Part of this was in cooperation with the Santa Barbara Museum of Natural History, and part wholly under our own auspices. There was other work, but it was not in the field. As a result we have now in hand or in press four archaeological reports dealing with California or neighboring states.

A. L. Kroeber,
University of California

Georgia. An archaeological survey of Georgia was begun in July, 1927. It is planned that each county be thoroughly investigated and a record made of all sites. These will be located upon a map of the county in which they were found, and both records and maps published together. Wherever available, type specimens of pottery fragments will be collected and stored for future study. Georgia is interesting geologically, in that there are three separate divisions; the coastal plain, the uplands, and the highlands. Each presents a different natural environment, and archaeological variations can be noted. To what extent this natural division has affected early culture will be shown when the survey is completed. To date, four counties have been thoroughly surveyed and many individual sites investigated. Through public interest, approximately 500 sites (mounds, villages, etc.) have been reported. These will be investigated as the different counties are surveyed.

Margaret E. Ashley,
Columbia University

In January Dr. Moorehead went to Cartersville, Georgia, to resume explorations of the Tumlin site, known as Etowah. The excavation of the mounds was completed, and a number of stone graves and their contents removed. Extensive work was then done on the nearby village site, which covers more than thirty acres, only a small fraction of which has been examined. In addition to a number of burials and smaller objects, several burned floors or platforms were uncovered at a depth of one to three feet. They may have been house sites or dance floors. These burned areas have all been carefully mapped and studied. The Etowah site, in the course of three field seasons, has yielded a very extensive collection of material.

Warren K. Moorehead,
Phillips Academy,
Andover, Massachusetts

Illinois. The archaeological survey of Illinois which was inaugurated in 1926 was continued through last spring and summer. Mounds, village sites, and trails have been fully recorded in ten of the northern counties. Local collections have been studied, and distribution maps are now being prepared. All historical data, surveyors' records, and other like sources of information are now being searched, while a final check is obtained by excavation of type sites in each locality. The most extensive excavations were carried on near Hanover in Jo Daviess county, and at Channahon in Grundy county, where the University cooperated with Mr. George Langford on the Fisher site. The purpose of the Hanover excavations was to learn the probable use of the mounds overlooking Apple river. Last season seven of these mounds were opened without finding any burials or other indication of their use. The series culminates in two huge mounds, one of which was opened this year. As in the smaller mounds there was a complete absence of burials. However, there were indications of a platform at the top, and it may be assumed that this mound, and probably the smaller ones also, was used as a platform or base for a ceremonial structure. A considerable amount of camp refuse, consisting chiefly of pottery fragments and animal bones, was found in the material of which the mound was constructed. Among the pottery pieces was a tripod leg for a bowl which resembles the lower Mississippi types. Several linear and conical mounds opened near Galena yielded burials. At the Fisher site the University cooperated with Mr. Langford in excavating several of the pits or de-

pressions which surround the two large mounds. It has been suggested that the pits may have been the lower parts of dwellings, but no timbers were found. However, the soil inside the pits is riddled with holes which were used as food containers, since some of them still contained shelled corn and unopened clam shells. Most of these caches had been filled with camp refuse, but portions of dismembered bodies appeared in several, accompanied by utensils of stone, bone, and shell. The pottery fragments seem to indicate that the pits were used by the builders of the primary mounds, and consequently antedate white settlement by a considerable time.

Fay-Cooper Cole,
University of Chicago

Early in April the Cahokia Mound Survey of the University of Illinois resumed operations. Under the direction of W. K. Moorehead, Mr. Jay L. B. Taylor, who was Engineer in Charge, and his staff spent four months working on mound no. 66, which is some 500 feet long and about 30 feet high. This mound is composed of heavy black gumbo, which presents little stratification. In the course of the excavations some two hundred skeletons were disclosed, which were in such poor condition that nothing but the crowns of the teeth remained. Excellent large diagrams were made by Mr. Taylor, showing the deposits in some detail. From September to December the Survey excavated near Havana on the Illinois river. In one mound each burial had been placed on a layer of large Tennessee flint discs, seven to nine inches in length. Decorated pottery, copper axes, split boar tusks, and ornaments made from upper and lower human maxillae were found. The revised report on four seasons' work at Cahokia will soon be issued. In addition to the purely archaeological section, it will contain reports by Dr. Leighton and Professor Baker.

W. K. Moorehead, Director,
Cahokia Mound Survey,
University of Illinois

Indiana. J. Arthur MacLean finished the excavation of the Albee mound in Fairbanks township, Sullivan county, early in August. A very interesting contrast is afforded between the burials discovered last year and those unearthed this year. Practically all of the former contained votive offerings, with a profusion of shell beads. The latter had few votive offerings and the ornaments associated with them

were quite different. One of the most interesting of these was a small copper gorget buried with a child. A portion of a string of shell beads under this gorget and protected by it remained intact, even the string being perfectly preserved. It was a very evenly twisted string of vegetable fiber. Only a very few small pieces of broken earthenware were found last year. This year several interesting vessels were discovered, one almost complete, another, evidently of very large size, in fragments. In all, during the two years, forty-one burials were unearthed. Enough of the skeletons were in a good state of preservation to secure fairly accurate measurements. The forms of burial were carefully noted and all material preserved. A complete report of the two years' work will be printed as soon as possible as an extra number of the *Indiana History Bulletin*.

C. B. Coleman, Secretary,
Indiana Historical Society

One of the several mounds opened by a field party under my direction during the past summer is located on the edge of the valley rim about one mile west of the town of Worthington, in Greene county, Indiana. It was a small mound located about 100 feet above the valley floor, and constructed largely of fine sand containing some loess-like material. The burials were in two horizons, one about 1½ to 2 feet below the surface, the other 3½ to 4 feet. The specimens in the lower horizon were much more decomposed than those in the upper horizon. Near the heads of the burials in the lower horizon pieces of pottery were found. Some of these were of small size and others were very large. The second mound, which is known as the Baker-Lowe mound, forms a conspicuous topographic feature, standing out on the valley floor, and is situated some three miles south of Worthington. This mound also contained two burial horizons and about the same kinds of artifacts as were found in the first one, namely, stone axes, hammers, spearpoints, arrowpoints, pearl ornaments, beads, awls, and potsherds.

W. N. Logan, State Geologist,
Indiana Department of Conservation

Iowa. The summer of 1927 was spent in the field in northeastern Iowa and in work on manuscripts in the library of the State Historical Society of Minnesota. The field work involved the study of numerous local collections of material, the examination of sites known to the

local collectors, search in many likely locations for new sites, and the excavation at Clermont, Fayette county, of three mounds. As in previous years, especial effort was made to find and collect material from pottery-producing sites. The work on manuscripts at St. Paul had to do with the very extensive materials collected by Theodore H. Lewis and Alfred J. Hill, 1881–1895, from fourteen of the north central states and entered under the title "The Northwestern Archaeological Survey." Much valuable information on Iowa archaeology was found here. With the exception of certain sites and localities that need to be revisited during 1928, the season saw the close of field work on what has been called the preliminary archaeological survey of the State. Some personal work has now been done by the undersigned in each of the ninety-nine counties; considerable newspaper publicity has been secured; some three thousand personal letters have been addressed and replies filed; and a bibliography has been prepared.

Charles R. Keyes, Research Associate,
The State Historical Society of Iowa

Kentucky. As the culmination of several years' activity in excavation, collection, and systematic description by the authors, the Kentucky Geological Survey has published volume 34 of series 6, entitled "Ancient Life in Kentucky," by Dr. W. S. Webb and Dr. W. D. Funkhauser, co-authors, of the University of Kentucky. This publication—the first in its particular field—is principally devoted to archaeology, though an introductory chapter or two deals with ancient life from a geological standpoint as preliminary to the presentation of the principal subject-matter. The authors have attempted to present a semi-popular discussion for the entire state. The subject-matter is illustrated with one hundred and seventy-five new maps, photographs, and diagrams. The Kentucky Geological Survey and the University of Michigan cooperated in a month's archaeological survey of the district about Monticello, in Wayne county. Dr. Carl E. Guthe, who conducted the work, devoted part of the period to exploration, and part to excavation. Evidences of Indian occupation were found to be most prevalent in the valley bottoms of the Cumberland river. Stone implements were also found, however, on farms on the highland rim, and also in the mountainous edge of the Cumberland plateau. Mounds seemed to occur sparsely only in the river bottoms. The limestone outcrops, which occur along the steep-sided

valleys leading back from the river, give rise to ledges of overhanging rock under which, in many cases, distinct evidences of Indian encampments were seen. Several of the many caves of the region showed traces of occupation. The Hines cave, which had been partly excavated some years ago by a group led by Dr. Webb and Dr. Funkhauser, was trenched in order to study stratification. Occupational debris was disclosed in well-defined strata to a depth of nearly ten feet, covering undisturbed sand and broken limestone. Near Eadsville a rock shelter was excavated, wherein hearths and occasional implements to a depth of four feet indicated that this shelter, representative of many of this district, had been used by Indians over a relatively long period.

W. R. Jillson, State Geologist,
Kentucky Geological Survey

Louisiana. Most of our work in local archaeology during the past year was in connection with collections which we had made, or which had been given to us, during the previous year,—stone and pottery objects from Lake Ponchartrain, Louisiana, stone and pottery from Lake Catahoula in northern Louisiana, and the Jones collection of pottery, stone, and shell from various parts of Alabama. The last includes two carved shell placques, and a small ornamental copper spearhead from Towesa, Alabama. Mr. Blom paid a visit to the Tom Harp plantation in Morehouse parish, where he inspected the mound group and made a sample collection. Barring a few post-holes, no excavation was attempted. The Morehouse material shows a close relationship with that from Lake Ponchartrain, which belongs to a general type reaching along the coast to Florida, whence it probably eventually was derived. The poor chipping may be due to the necessity of using even the most refractory stone in a district where all stone is rare. The Catahoula material, on the other hand, is finely chipped and in some cases polished, and seems to be related to the cultures further north in the Mississippi valley.

Oliver LaFarge, acting in charge,
Department of Middle American Research,
Tulane University of Louisiana

Michigan. During the year, twenty-five hundred old maps have been examined critically for the purpose of locating the old trails, portages, copper mines, corn fields, village sites, burying-grounds,

sugar camps, earthworks, and other evidences of Indian occupancy. About twenty-two hundred of these are various township maps prepared and filed by the official government surveyors who "laid out" the state in accordance with Hutchins' scheme for all the government lands, adopted after 1816. Four hundred of these township charts with the accompanying field notes, record hundreds of items, mostly trails, which have been entered upon a series of uniform maps of the various counties. Similar data were also obtained from many old French maps, dating back in some cases to before 1664, upon which are located villages, paths, waterways, mines, and missions. Photostat copies of convenient sizes of every map that comes into our hands are filed among the records of the department. A number of archaeological sites were visited during the course of the summer by Dr. Hinsdale and Dr. Greenman, near Ludington and other parts of Michigan. As far as possible such reconnaissance is done during the early summer before the rank growth of vegetation obscures the smaller earthworks. In June, Dr. Hinsdale spent ten days excavating a series of mounds on the shores of West Twin lake, in Albert township, Montmorency county, upon the property of Mr. Herman Lunden. Mr. Lunden expressed a lively interest and rendered valuable aid, particularly by having the mounds restored to their original contour and then turfed over, in conformity with accepted archaeological procedure. The burials in some of these mounds were in three horizons. The lowest burial was three feet below the ground-level, the middle stratum about two feet above ground-level, and the uppermost eighteen inches below the crest of the mound. Twenty-three human skeletons, a skeleton of a dog, and several other specimens were obtained. Dr. Hinsdale recently published a pamphlet upon the Indians of Washtenaw county, and a paper on "Indian Corn Culture in Michigan." Dr. Greenman, in addition to continuing his studies of the earthworks of Michigan and their distribution, devoted some time to an intensive investigation of the region about Cross Village, which has been an Ottawa settlement since the earliest records. He obtained a good collection of potsherds and several early trade articles. Mr. Edward J. Stevens, Secretary of the Michigan State Archeological Society, recorded a series of camp sites along the Paw Paw river. Kalamazoo has formulated plans for a museum in connection with the Public Library. Dr. Hinsdale has made a special study of the extensive pharmacy used by Michigan Indians, and of their methods of gathering, preserving, and preparing various

roots, herbs, and barks for medicinal purposes, which has resulted in a large collection of data and specimens illustrating this subject. In the more isolated communities the Indians still retain the older medicinal customs, and prefer their own doctors and midwives, in distinction to those Indians living near European communities, who make use of the "white man" doctors.

W. B. Hinsdale,
Museum of Anthropology,
University of Michigan

Nebraska. The Nebraska State Historical Society has conducted explorations along the entire length of the Loup River valley, along the Republican River valley, and in the Nemaha River valley in the southeastern corner of the state. A number of isolated localities have been explored and reported as occasion demanded. This exploration is the result of five years' effort on the part of E. E. Blackman, curator of the museum. Near the mouth of the Nemaha river is an extensive ruin which covers a half section of land. This site marked the beginning of our efforts to chart systematically the Missouri River area of the state. It does not show evidence of earth houses, but rather of tipis, with which were associated caches both within the house circle and around it. The village was permanent rather than temporary, and a study of the site and the nearby burial mounds indicates that many years have elapsed since its occupation. From it has been gathered a large quantity of artifacts which are now in our museum. The flint implements were skilfully made, resembling in workmanship those from certain regions in Ohio, and differing very much from the typical Nebraska implements, both in workmanship and material. Some of them are of flint from Kentucky, Tennessee, and the east. A well-shaped, unbored "Monitor" pipe was found, indicating that the form was known. The pottery resembles the Osage ware in being shell-tempered, but the forms of the vessels, rims, handles, and decoration are similar to the Ohio types. According to Indian legend, the Skidi band of the Caddoan linguistic stock built a "grass house" village near Genoa, Nebraska, as early as 1350 A.D. This site, as well as a number of earth house villages along the Loup River valley, has been excavated and studied. The hills of the area as far north as the Niobrara valley are dotted with archaeological sites, in many of which excavations have been made and collections obtained. The pottery is tempered with sand and

crushed potsherds. The decorated handles and rims are typical and numerous. In the Republican valley the permanent villages of the three bands of Pawnee who left the region about 1800 have been cross-sectioned and studied. The materials found on the site, as well as documentary evidence, indicate that these sites are historic. The large area north of the Loup river still remains to be explored and charted.

E. E. Blackman, Curator,
Nebraska State Historical Society

Nevada. Mr. M. R. Harrington of the Museum of the American Indian, Heye Foundation, undertook a reconnaissance of Pueblo sites in Nevada for several months and then devoted his attention to excavating some dry caves on the Pyramid Lake reservation, in Washoe county.

George G. Heye, Director,
Museum of the American Indian,
Heye Foundation

New Mexico. Dr. F. H. H. Roberts, Jr., of the Bureau of American Ethnology, spent June and July in the Chaco canyon, New Mexico, excavating a Basket Maker III village. The site was quite extensive, containing eighteen houses, forty-eight storage cists, and one large kiva or circular ceremonial room.

H. W. Dorsey, Chief Clerk,
Smithsonian Institution

Mr. Morris made a few preliminary trial excavations at the ruins adjoining the Aztec Ruin National Monument, revealing hitherto unobserved evidence of cremation as a prehistoric burial custom. The major archaeological work of the season, however, was the excavation of burial sites at Mitten Rock and Tocito, New Mexico, by Dr. H. L. Shapiro. These sites, as well as others in the valley of the La Plata river which were also excavated, in cooperation with Mr. Earl H. Morris, were rich in post-Basket Maker burials, and gave a good return of skeletons and pottery.

Clark Wissler,
Department of Anthropology,
American Museum of Natural History

The Pueblo Bonito expeditions of the Society were concluded in 1926, but in 1927 the writer returned to Chaco canyon, northwestern New Mexico, to begin preparation of his final report on the explorations. No excavations were undertaken during the past season. As opportunity offered, further study was made of various works on the cliffs bordering Chaco canyon. Previously we had observed flights of broad stairways, pecked from solid sandstone, and cleared paths—described by Navaho Indians as "roads"—each leading from the canyon rim back across the mesas, usually toward the head of a rincon in which pine trees may formerly have grown. I am inclined toward the belief that these so-called "roads" and the stairways were constructed by the old Bonitians to facilitate transportation of timbers used in their great communal dwellings. Terraces supported by massive masonry are to be found here and there in the breaks of the canyon. Stairways cut where steps seemingly were not required, holes pecked in exposed surfaces from which all loose stones had been cleared and piled circularly, and other evidences of Bonitian industry that attracted our attention in the earlier years, were examined. But the real reason for returning to Pueblo Bonito in 1927 was to begin the writing of our reports on the seven-year National Geographic Society expedition. It is hoped these reports may be completed within the year.

Neil M. Judd, Director,
Pueblo Bonito Expeditions,
National Geographic Society

Mr. and Mrs. Cornelios B. Cosgrove finished their excavations of Swarts Ranch pueblo, in the Mimbres valley, New Mexico. Seventy-two skeletons were uncovered and one hundred and seventy-six pieces of pottery and one hundred and thirty other artifacts secured. After the work was finished at this pueblo, a cave in the vicinity of Las Cruces, New Mexico, was explored, also another near El Paso in Texas. Some of the material recovered was undoubtedly of Basket Maker origin. It included bags, coiled basketry, darts used with spear-throwers, and other articles usually found with this class of remains.

C. C. Willoughby, Director,
The Peabody Museum,
Harvard University

The tenth field season of the Pecos Expedition of the Department of Archaeology of Phillips Academy, Andover, was devoted to the excavation of a Pueblo ruin on the west side of the Arroyo de Pecos, opposite Pecos. Preliminary work had been done at this site during the summer of 1926. About one hundred rooms and four kivas were cleared and some seventy-five skeletons were removed. The houses were found to have been built of adobe, but, because of poor construction and extensive destruction by floods, the walls were in very poor condition. The site dates from a period prior to the foundation of Pecos itself, and it was abandoned before the beginning of the first Glaze period. There is evidence that the occupants were forced to leave the site because of its defenseless situation and that they established themselves upon the Pecos mesa in order to avail themselves of the protection offered by the rocky bluffs which surround it. The principal interest of the excavations lay in the fact that they produced a pure sample of the material culture of the Pecos Indians during the black-on-white period.

A. V. Kidder,
Department of Archaeology,
Phillips Academy, Andover, Massachusetts

A field season's work of six weeks was carried on in the Mimbres region in southwestern New Mexico, practically completing the field work at the Cameron Creek site in preparation for a detailed report. Three previous expeditions had been made to the same site. The work this year was undertaken in co-operation with the Museum of New Mexico. The balance of the year was spent in intensive laboratory work and instruction, using the material obtained in this field work as a basis. Occasional exploration trips were taken into the mountains of San Diego county, California, but no excavation work was undertaken.

Wesley Bradfield,
The San Diego Museum

Excavations were begun by the Southwest Museum at the ruin on the Manuel Galaz ranch near Silver City, New Mexico, in the Mimbres area. The ruin proved so large, and our own time and resources so relatively inadequate, that nothing conclusive can be said of this operation. A number of excellent specimens of pottery, shell ornaments, bone work, and a copper bell, were secured. A trip of

reconnaissance was made along the Little Colorado and in adjacent regions in western New Mexico, using Springerville, Arizona, as a base, and covering the region from the Santa Fe railroad to the Mexican border. Sherd collections were secured from one hundred and two different sites, to form the nucleus of our "sherd library" at the museum.

Charles Amsden, Curator,
The Southwest Museum

New York. During the year 1927 the Rochester Municipal Museum continued its examination of archaeological sites in New York, Pennsylvania, and Ontario. Intensive work was done at two stations: one at Levanna, Cayuga county, and one at Lamoka, Schuyler county. The Levanna site proved to be of the third Algonkian period and identical with the Owasco site explored in 1916. Field examinations revealed a widespread occupation throughout the Finger Lakes region of central New York by these people. They were in possession of the region when the Iroquoian people came in about 1300 A.D. The Lamoka station at the head of Lamoka lake proved of considerable interest because of the abundance of its artifacts. In a trench 28 feet wide and 225 feet long more than five thousand specimens were taken out this year. The deposits, which were stratified, were nearly 6 feet deep, the original layer being directly upon the original valley floor. The lower deposits contained many metates, some bone implements, numerous arrowpoints, net sinkers, and many hammerstones and mullers. Above this the layers were rich in bone and antler implements, more than thirteen hundred being recovered. About twelve are painted with red spiral stripes from end to end, these being the only examples of painted bone and antler we have noted from any sites in the eastern areas. The Lamoka occupation began as one of non-pottery users. Its first inhabitants were thin-skulled dolichocephalic people who occupied the site as a fishing station, and evidences seem to indicate that here they dried fish and eels in enormous quantities. When they had built up refuse layers of more than 4 feet, another people came in and destroyed the first occupants. The newcomers were a brachycephalic people who brought with them marine shells and olivella beads. They seem to have tortured, burned, and eaten the original inhabitants. The roundheads continued the occupation of the site and were pottery makers. In every skeleton of the brachycephalic people, the burial was in the

flexed position. In all cases there was abnormal dentition with supernumerary teeth, particularly incisors. The date of this occupation seems quite remote. The culture converges at the point where the archaic and intermediate (ceramic) periods meet. The site is from 2000 to 4000 years old in the opinion of those who have worked upon it and know the characteristics of the New York occupations.

Arthur C. Parker, Director,
Rochester Municipal Museum

In New York state archaeological work was done during the summer by Mr. Frederick P. Orchard in the vicinity of Port Washington, Long Island, and also by Mr. Foster H. Saville in the vicinity of South Hampton, Long Island.

George G. Heye, Director,
Museum of the American Indian,
Heye Foundation

Ohio. The archaeological activity of the Ohio State Museum, during the year 1927, centered in the examination of the great central mound of the Seip Group of Prehistoric Earthworks, in Ross county, Ohio. This structure, the second largest tumulus of the highly developed Hopewell culture in existence (Hopewell proper being the largest), was the object of explorational activities during the summer of 1926. Approximately one-fourth of the mound remains to be examined this coming summer, after which the tumulus will be restored to its original form, and a small park of ten acres will be created. The mound is 250 feet in length, 150 feet wide, and 30 feet in height. A total of seventy-nine burials have been disclosed, with probably ten to fifteen burials remaining to be exhumed. A gratifying amount of material has accrued from the explorations of the structure, with the result that the culture of its builders is well illustrated. A short time during the spring was devoted to a preliminary examination of two dry caves or rock shelters in southern Ohio, in which interesting evidences of human occupancy were found. Perishable material, such as woven fabric, twine and cord, sandals, feather work, and so forth, were secured, as well as two partially mummified skeletons.

H. C. Shetrone,
Ohio State Museum

Pennsylvania. The Indian Survey of Pennsylvania has made real progress in the year 1927. The bill introduced into the Legislature passed the Senate unanimously, and was about to be presented for action in the House, when the governor changed his plans and put the project in the Code for the State Historical Commission, allowing an appropriation of $10,000 for the work in the General Appropriations Bill. The governor followed this action by appointing to the Commission Miss Frances Dorrance, the Director of the Wyoming Historical and Geological Society, who has been the active promoter of the Survey, and is now the secretary of the Commission. The preliminary survey of the state will be completed under the Commission. Mrs. Alanson Skinner has been engaged to inspect the collections and records held by the collectors and to transfer to the quadrangles of the Geodetic Survey the information secured by the preliminary survey. A new development is the ethnological study of those descendants of the Delaware tribes who are still living in tribal groups in this country and in Canada. Dr. Frank G. Speck of the Department of Anthropology of the University of Pennsylvania will direct the work. Since the State Historical Commission cannot co-operate with other organizations in archaeological research because of the question of ownership of specimens found, and also cannot raise money for such a project, nor spend the principal of any fund thus raised, it was necessary to put the work of the extended survey under the directorship of some other organization. Consequently at the annual meeting of the Pennsylvania Federation of Historical Societies, an organization for some time in full sympathy with the Survey, in January of 1928, a resolution was passed that the President of the Federation appoint a committee of five, with power to act in the raising of the fund and the direction of the Survey. It is hoped that with the coming of spring, sufficient funds may be collected to permit not only starting the field work at once, but extending it as well.

Frances Dorrance, Director,
Wyoming Historical and Geological Society

South Carolina. Dr. J. Walter Fewkes, Chief of the Bureau of American Ethnology, made a reconnaissance of the mounds in the neighborhood of Greenville, South Carolina, selecting several promising sites for future excavation. While in Greenville, Dr. Fewkes

examined a few collections of archaeological specimens from the vicinity.

H. W. Dorsey, Chief Clerk,
Smithsonian Institution

South Dakota. In the last report mention was made of the village site of doubtful origin on Firesteel creek near Mitchell, Davison county. We have been successful in having this site included in a tract of land purchased by the City of Mitchell for a reservoir. The old village is on a high terrace and will be preserved and developed as part of a city park. Groups of burial mounds have recently been located at Faulkton, Faulk county, and at Wessington springs, Jerauld county, which are of the same origin as all other mounds examined within the state. This record extends the western limits of the habitat of these early builders. No active field work of importance has been done this year, due to lack of funds.

William H. Over, Curator,
University of South Dakota Museum

Tennessee. Dr. Walter Hough, Head Curator of Anthropology, U. S. National Museum, was detailed to the Bureau for the purpose of examining a large burial mound at Indian Mound, Tennessee, in the summit of which several slab-box burials had been brought to light. He also visited village sites, flint quarries, and burial grounds in the vicinity, collecting numerous specimens.

H. W. Dorsey, Chief Clerk,
Smithsonian Institution

Texas. During the past year it has been possible to keep a force of men in the field investigating various camp sites and "burnt rock mounds" in the region around Austin. Several weeks were spent on a large mound at Cedar Park, eighteen miles northwest of Austin. The deposits are 5 feet 10 inches deep near the middle, and cover an area of about 300 by 150 feet. All of this large accumulation is entirely kitchen midden deposit, and we have recovered about two thousand specimens of artifacts therefrom, many of which seem to be peculiar to this region, and evidence the greatest possible skill in the art of chipping. We are finding rather positive traces of different culture levels. Recently I secured a collection of particularly beautiful examples of stone art, gathered in the hills some hundred miles west

of Austin, among which are several fine flint fishhooks. Since acquiring these I have visited private collections in different parts of the state and have found similar specimens in four of them. Many of these hooks show evidences of weathering incident to long exposure. At present it is my opinion that they are genuine ancient artifacts. However, I have not had time as yet to run down the history of these fishhooks, nor have I found specimens *in situ* in my field work.

J. E. Pearce,
University of Texas

Dr. F. H. H. Roberts, Jr., Archaeologist of the Bureau of American Ethnology, investigated cave sites near El Paso, Texas, during May.

H. W. Dorsey, Chief Clerk,
Smithsonian Institution

The first of our three objectives is a general survey of the Big Bend territory of Texas. During the past year seventeen additional sites have been located, which brings the total record up to one hundred and thirty-five localities in which some evidence of former Indian occupation has been recorded. Some of these places are open camps, some are rock shelters, and some are primarily pictograph or petroglyph sites. All have yielded more or less to the culture picture we are attempting to outline. A number of specimens as well as photographs, field notes, and drawings have been added to the museum collections. The skeletal remains have been forwarded to the U. S. National Museum. Our second aim has been a more intensive study of the dry rock shelters. With this idea in view a special permit has been secured from the owners of a particularly desirable site and work has commenced in the blasting away of obstruction rock and in the clearing of the entrance. Several specimens of interest and value have already been found. It is planned to continue this work as time permits. The third aspect of study concerns the pictographs and petroglyphs. In this investigation we have been particularly fortunate in having the aid and interest of O. L. Sims, of Paint Rock, Texas, who spent a large part of the past year in detailed and painstaking work at a large number of sites. It is hoped that this extensive and valuable material so carefully gathered by Mr. Sims will be available for publication at an early date.

Victor J. Smith,
West Texas Historical and Scientific Society

Utah. During 1927, the field work in San Juan county, Utah, was continued. The archaeological survey of the territory between Cottonwood Wash and Whiskers Draw was begun, and will be continued as facilities permit. No excavations were undertaken. However, some one hundred and fifty specimens of pottery, as well as a number of stone axes and hammers were added to the collections.

A. A. Kerr,
University of Utah

Dr. F. H. H. Roberts, Jr., of the Bureau of American Enthology, spent August and September in a reconnaissance of the Montezuma Creek district in southeastern Utah.

H. W. Dorsey, Chief Clerk,
Smithsonian Institution

Early in the summer, Mr. Charles L. Bernheimer organized and led the sixth Bernheimer Expedition to the Navajo Mountain district in southern Utah and northern Arizona. Mr. Bernheimer reports the achievement of the objectives laid down for this season's work which were, in the main, to gather information on and locate sites of archaeological interest, to search for traces of animals of the Jurassic period, and to find a natural bridge of which reports had been heard. The expedition was eminently successful in every respect. Hundreds of prehistoric dwelling sites were seen and noted for possible future examination, though in every case preliminary search was made for potsherds and burial sites. At Bogoha Labyrinth, inaccessible cliff house sites were seen, and also a burial cist. A beginning was made for a trial excavation, but the falling of a huge boulder prevented continuation of the digging. Here also was discovered the most interesting ruin seen this summer, a cave containing mud and grass-walled but roofless houses built in pairs. These showed no signs of habitation, but the ground in front of the cave was strewn with potsherds of many types.

Clark Wissler,
American Museum of Natural History

Washington. Mr. H. W. Krieger, Curator of Ethnology, U. S. National Museum, was detailed to the Bureau of American Ethnology to continue his investigations along archaeological lines in the valley of the Middle Columbia and of the Snake rivers. Evidence

was exhumed in the vicinity of the Dalles, Oregon, showing the penetration of early northwest coast culture to that region. At the mouth of the Yakima, a cemetery was excavated where evidence was recovered showing the identity of culture with that of archaeological sites in British Columbia on the upper Frazer river. At Page, Washington, on the Snake river and in the canyon of the Snake fifty miles south of Lewiston, Idaho, additional evidence was obtained to indicate that the same culture at one time existed in the valley of the Snake. Certain rock sculptures in the canyon of the Snake and an atlatl recovered at Page seem to point also to an early connection with the Basket Makers.

H. W. Dorsey, Chief Clerk,
Smithsonian Institution

Wisconsin. An archaeological survey of the Geneva and Como Lakes region in southeastern Wisconsin was conducted by the Wisconsin Archaeological Society in cooperation with the Geneva Lake Historical Society. Mr. Charles E. Brown directed the field work with Mr. Theodore T. Brown as his principal assistant. During this survey several unrecorded mounds were located and excavated, and a considerable number of camp, village, workshop, and burial sites were mapped. Collections were obtained from every site, and the local collections were examined. The Geneva Lake Historical Society erected four bronze tablet markers on the Chicago trail, both on the south shore of the lake and at Fontana. Plans were made for a future historical museum and for an Indian camp ground at Geneva lake. During the year archaeological investigations were also conducted by various members of the Wisconsin Society in Jefferson, Sauk, Dane, and Kenosha counties. Several members of the Winnebago County Archaeological and Historical Society, an auxiliary of the Wisconsin Society, investigated the mounds and burial places in Shawano and Winnebago counties. The Oshkosh Public Museum purchased the archaeological collection of the late S. D. Mitchell, and the State Historical Museum acquired that of the late Dr. C. H. Hall. At Aztalan Mound Park the Wisconsin Archaeological Society made several improvements, including the placing of a descriptive metal tablet. Local movements for the preservation in parks of additional mound groups and for the founding of a number of additional museums were set in motion in several cities of the state.

Charles E. Brown,
Wisconsin State Archaeological Society

The summer season was devoted to the field study of two effigy mound groups, each including conicals and linears: the Kletzien group in Sheboygan county, and the Nitschke group in Dodge county. The expedition was led by W. C. McKern. The work accomplished included the charting and mapping of ninety-five mounds and one intaglio, the excavation of sixty-four mounds, and the acquisition of approximately one thousand study specimens. One hundred and seventy photographs were taken. A quantity of good skeletal material was added to the museum's study collections. The usual effigy mound culture was the only culture represented in the mounds or their contents. Inclusive burials, the chief features, were encountered indiscriminately in mounds of all shapes. Interesting pottery specimens and bone implements were found with the burials. With one exception, the skulls in all of them, where materials were sufficiently preserved to permit ascertainment, were entirely free from cradleboard deformation.

W. C. McKern,
Associate Curator of Anthropology,
Milwaukee Public Museum

Canada. Mr. D. Jenness spent the summer in Newfoundland seeking remains of the extinct Beothuk Indians. He visited Badger's brook, and Red Indian lake, and explored the coast and islands from the Bay of Exploits to Canada Harbor. On Long Island, in the Bay of Exploits, he discovered an untouched grave that contained the skeleton of an old woman, part of a second cranium, and many of the carved bone ornaments that were peculiar to Beothuk culture. From these and other sources, he obtained interesting collections of Beothuk material, which throw some light on the early history of these people and of their Eskimo neighbors to the north. Mr. W. J Wintemberg made an archaeological reconnaissance from Tadoussac to the mouth of Richelieu river, Quebec, and excavated what appeared to be an early Algonkian workshop at Tadoussac. Mr. Harlan I. Smith carried on an archaeological reconnaissance in the vicinity of the Lower Skeena valley, British Columbia, incidental to his work on the preservation of totem poles. He also made a mould of the large intaglio petroglyph near Prince Rupert, one of the most striking petroglyphs in Canada, and began the intensive examination of a shell-heap on the property of Seal Cove Lumber Company at Prince Rupert. The minimum antiquity of this heap is indicated by a red

cedar stump bearing 364 rings of annual growth. This work was made possible through the co-operation of Mr. C. P. Riel.

Harlan I. Smith, Archaeologist,
Victoria Memorial Museum

Mr. Donald A. Cadzow made a comprehensive collection of archaeology from Cape Dorset, and also on the east coast of Labrador. Mr. George G. Heye excavated some old house sites on the Saanich peninsula, Vancouver Island, British Columbia.

George G. Heye, Director,
Museum of the American Indian,
Heye Foundation

Mexico. Dr. Herbert J. Spinden visited Middle America and was successful in finding an important ruin in southern Vera Cruz, Mexico. Its local name is Cerro de las Mesas, and the remains can be ascribed to the Olmeca. Human figures in low relief are shown on the monuments, also hieroglyphic inscriptions with dates.

C. C. Willoughby, Director,
The Peabody Museum,
Harvard University

A reconnaissance trip was made through northeastern Sonora, following the valleys of the Bavispe, Yaqui, and Sonora rivers, and extending as far south as the middle course of the Yaqui. The western periphery of the Casas Grandes area was definitely traced in the Bavispe and Yaqui valleys. The Sonora valley, farther west, contained plain brown ware of a modern type, with no trace of Casas Grandes or other type wares. House types in each area showed the rectangular grouped form, more orderly and distinctive in the peripheral Casas Grandes than in the Sonora valley, where the arrangement departed somewhat from the true pueblo form. Walls apparently consisted of a cobble or slab foundation, and had an upper roof-wall of brush. Twenty-four sites were identified, and sherd collections made. A report of this expedition is to be published soon.

Charles Amsden, Curator,
The Southwest Museum

Alabama Anthropological Society	Alabama
American Museum of Natural History	Arizona, New Mexico, Utah
Arizona State Museum	Arizona

Bureau of American Ethnology	*See* Smithsonian Institution
Columbia University	Georgia
Indiana Department of Conservation	Indiana
Indiana Historial Society	Indiana
Kentucky Geological Survey	Kentucky
Milwaukee Public Museum	Wisconsin
Museum of the American Indian, Heye Foundation	Nevada, New York, Canada
National Geographic Society	New Mexico
Nebraska State Historical Society	Nebraska
Ohio State Museum	Ohio
Peabody Museum, Harvard University	Arizona, New Mexico, Mexico
Phillips Academy, Andover	Georgia, New Mexico
Rochester Municipal Museum	New York
San Diego Museum	New Mexico
Smithsonian Institution	Alaska, New Mexico, South Carolina Tennessee, Texas, Utah, Washington
Southwest Museum	Arizona, New Mexico, Mexico
State Historical Society of Iowa	Iowa
Tulane University of Louisiana	Louisiana
Turney Museum	Arizona
United States National Museum	*See* Smithsonian Institution
University of California	California
University of Chicago	Illinois
University of Illinois	Illinois
University of Michigan	Michigan
University of South Dakota	South Dakota
University of Texas	Texas
University of Utah	Utah
Victoria Memorial Museum	Canada
West Texas Historical and Scientific Society	Texas
Wisconsin State Archaeological Society	Wisconsin
Wyoming Historical and Geological Society	Pennsylvania

CARL E. GUTHE, *Chairman,*

CENTRAL SECTION, AMERICAN ANTHROPOLOGICAL ASSOCIATION

The 1927 meeting of the Central Section of the American Anthropological Association convened in Chicago, March 25, at the Rosenwald Hall, University of Chicago. This was preceded by a meeting of state archaeologists, called by Dr. A. V. Kidder, held on the 24th and attended by members from states, west, east, and south.

The session was called to order by the President, Dr. Charles R. Keyes. The address of welcome was made by Professor Woodward, Vice-President of the University of Chicago, and responded to by President Keyes, who complimented the University of Chicago on

the advance made by it and its staff in anthropological work in the past few years.

A motion made by Charles E. Brown, Chief of Museum, Madison, Wisconsin, and seconded by Dr. Carl Guthe, of the Museum of Anthropology, Ann Arbor, Michigan, to grant the privilege of the floor to non-members of the Central Section was carried.

The opening number of the program, a discussion of "Publications of the Past Year on Archaeology, Anthropology, and Ethnology in the States included in the Central Section's Territory" brought out an extensive list. Regular publications as noted were:

The Wisconsin Archaeologist
The Ohio Archaeological and Historical Quarterly
Arrow Points, of Montgomery, Alabama

Illinois reported papers and other publications by Central Section members of that state as:

W. D. Strong, An Analysis of Southwestern Society. (AMERICAN ANTHROPOLOGIST.)

Walter Krogman, Aspects of Human Teeth and Dentition. (Journal of Dental Research.)

Charlotte Gower, The Origin and Spread of Antillean Culture.

Fay-Cooper Cole, The Nature of World and Man, containing a section on Primitive Man. (Published by the University of Chicago.)

W. D. Wallace ,An Introduction to Anthropology. (New York: Harper Bros.)

W. D. Hambly, Origin of Education among Primitive People. (New York: Macmillan & Co.)

Texas reported:

J. E. Pearce, An Anthropological Diary. (Bulletin of the University of Texas.)

J. E. Pearce, Texas Archaeology. (Bulletin of the University of Texas.)

Alabama reported:

Folk Study of the American Negro,—and other papers.

Mississippi reported:

Calvin Brown, Archaeology of Mississippi. [This is an outstanding work of its class.]

Michigan reported:

W. B. Hinsdale, Primitive Man in Michigan. (Michigan Handbook, Series No. 1, of the University Museum, Univ. of Mich.)

W. B. Hinsdale, Indian Trails and Waterways of Michigan. (Michigan Academy, 1927.)

Emerson F. Greenman, Mounds in Michigan with Special Reference to Two in Missaukee County. (Michigan Academy, 1927.)

Ohio reported:

H. C. Shetrone, The Exploration of the Hopewell Group. (Ohio Archaeological and Historical Society.)

W. C. Mills, Certain Mounds and Village Sites in Ohio. (Ohio Archaeological and Historical Society.)

The first paper of the morning was by Dr. E. Sapir on "Secret Rituals among the Nootka Indians," in which he brought out the difficulty of securing the data, although they have a ritual for nearly everything.

In "The Teaching of Anthropology," Professor J. E. Pearce of the University of Texas, expressed as his observations that this study should not be left for college students alone, but should begin with the high school at least; or even farther back when the child becomes interested in man and his environment.

Miss Frances Dorrance, Curator of the Wyoming Historical and Geological Society, in her talk on "Preliminary Archaeological Survey of Eastern Pennsylvania," explained what was being attempted in the Keystone state. In March, 1924, the Society decided to undertake an archaeological survey of eastern Pennsylvania, limited to the Susquehanna watershed, which survey later was extended to include the entire state. The plan of work consists of a preliminary survey, now completed; and field work, to be based on the paper survey and search of records; and the publication of findings. The preliminary work brought information on 1,900 unexplored sites, some 450 offers of assistance, and the locating of 1,200 collections. Proceeding on the premise that it would require $200,000 for five years work, state aid, to give the necessary authority in field work, to the amount of $20,000, was asked from the legislature. The rest is expected to be raised among individuals, organizations, and other sources.

Peter A. Brannon, Director of the Department of Archives and History, Montgomery, Alabama, had for his subject, "Urn Burials in the Vicinity of Montgomery, Alabama, and Some Deductions Therefrom." He described methods of locating the burials, and what was usually found in each urn, based on the discovery of more than 500 burial vessels. Ear plugs and hair pins were among the unusual articles discovered.

A brief business session followed at which the chair appointed members of the various committees. The Auditing Committee was made up of Dr. Ellsworth Faris and Miss Charlotte D. Gower, both of the University of Chicago.

The Nominating Committee appointed consisted of Charles E. Brown, Madison, Wisconsin; E. Stevens, Kalamazoo, Michigan, and J. E. Pearce, Austin, Texas. On the Resolutions Committee were placed Carl Guthe, Ann Arbor, Michigan, W. C. McKern, Milwaukee, Wisconsin, and E. K. Putnam, Davenport, Iowa.

At the afternoon session, also held in Rosenwald Hall, H. C. Shetrone of the State Museum, Columbus, Ohio, gave a résumé of the archaeological work in Ohio in 1926, detailing the discoveries in the Seip mound, and other labors undertaken.

Dr. Charles R. Keyes, State Archaeologist of Iowa, gave a brief presentation of the discovery of "The Adel Grooved Axes," followed by a second paper on "A Village Site on the Big Sioux," with slides. Some burials at this site are found at a depth of seven feet.

Dr. Berthold Laufer, Field Museum, Chicago, read "Methods in the Study of Domestication." Domestication of animals in the past and even today was not, in many cases, for material purposes. Milk was not used by Chinese and other Asiatics, although they had cattle. Others raised sheep but did not use the wool; hogs, but did not eat the flesh; or chickens without utilizing the eggs. The ox was both a sacrificial and working animal. The fundamental use of domestication in eastern Asia was divination. The hoofs of the ox and horse were utilized in southwestern Asia, bones of animals in central Asia, the carapace of a turtle in China, and in Malaysia and elsewhere, the femur of a cock, was used in divination.

Charles E. Brown, Secretary of the Wisconsin Archaeological Society, told of "The Preservation of Indian Landmarks in Wisconsin." In the Badger State 500 mounds in 30 localities have been saved. At Madison 200, in 18 groups, are safe from destruction. The great destroyers of the present day are the tourist, with his thirst for a curio or memento, and waterpower development, which by ponding streams has hidden many a fine mound and village site.

E. J. Stevens, Secretary of the Michigan State Archaeological Society, described the "Michigan State Archaeological Survey." He gave the history of the work in Michigan, which until recently was negligible, and told of the organization of the Michigan Archaeological Society.

"Archaeological Work in Illinois under the University of Michigan," was Miss Charlotte D. Gower's topic. With maps and slides she detailed what had been accomplished the previous season. Three hundred and seventy-two mounds were found, of which 254 were previously unrecorded. These included a serpent mound and one large group which was excavated without startling results.

The visiting members and friends were tendered a dinner by the University of Chicago. This was served at the University Club, where the evening meeting was held.

The evening's program was under charge of Dr. A. V. Kidder, who spoke on "Modern Methods in Archaeological Research." By basic laws, which controlled man in the past and will in the future, mankind's history is being reconstructed. He discussed phases, particular to America, and told of a chronological sequence based on trade specimens, and of another based on dated Maya monuments.

Dr. Carl E. Guthe described his collecting work in the Philippines, and detailed the plans for the new museum of the University of Michigan. H. C. Shetrone, Curator of Archaeology, Ohio State Museum, Columbus, gave a brief sketch of plans for future archaeological work in Ohio. Dr. Fay-Cooper Cole, University of Chicago, spoke on the aid archaeology can and does offer to anthropology; the converse of the proposition he likewise held to be true.

The Treasurer reported a considerable sum in the Section's treasury. A committee consisting of Sapir, Cole, and Fox was appointed to recommend some plan of utilizing a part of this surplus.

The regular sessions on Saturday, the 26th, were held in the Field Museum of Natural History. The meeting was called to order at 9:30 A. M. by President Charles R. Keyes. Dr. Berthold Laufer, on behalf of the Field Museum, gave the introductory address. The first regular paper was presented by W. D. Strong, Assistant Curator, Department of Anthropology, Field Museum. His subject, "Petroglyphs of the Columbia River and Their Relation to Those of Adjacent States," was illustrated by an excellent collection of slides.

Frank W. Aldrich, Bloomington, Illinois, brought a large and valuable series of slides to illustrate his paper entitled, "Some Types of Cave and Rock Shelters in Western Europe."

Henry Field, Curator of Physical Anthropology, Field Museum, presented the results of the "Field Museum-Oxford University Expedition at Kish, Mesopotamia, Season of 1925-1926." This too, was well illustrated.

In "Prehistoric Chronology," A. T. Olmstead, Curator of the Oriental Museum, University of Illinois, Urbana, gave facts and other evidence that led him to give a dating to certain periods. The first Egyptian dynasties date back not more than 3,000 B. C. The first appearance of pottery may be set down as about the fifth millennium before Christ. The Neanderthals he dated as of 7,000 B. C.

W. D. Hambly, Assistant Curator, Department of Anthropology, Field Museum, gave the final paper of the morning. He discussed "Tattooing and its Significance."

The business meeting of the Section followed. On motion of Dr. Faris, seconded by Miss Gower, the reading of the minutes of the 1926 meeting were dispensed with.

The Secretary's report showed

Members, 1926	72
Transferred to the Main Association	1
Total, 1926	71
New active members for 1927	8
New associate members for 1927	8
Total members, 1927	87

The Central Section in 1927 had 70 active and 17 associate members. The membership by states shows 29 living in Chicago and 5 in other parts of the state of Illinois. Wisconsin has 15 members, 9 from Milwaukee. Michigan has 10 members, Ohio 8, Tennessee and Iowa 3 each, and Nebraska and Missouri 2 each. The following states have 1 member each: Colorado, Texas, Arkansas, Minnesota, Mississippi, California, North Dakota, New York, Massachusetts, and Canada.

The Secretary reported 298 letters posted for the Section since the 1926 meeting.

The Treasurer's report showed

Cash as per the 1926 report	$142.67
Received annual Section dues	72.00
Gift of Dr. O. L. Schmidt	25.00
Total	239.67
Expenses, stamps, and printing	24.35
Balance	235.32
Check drawn but not cashed	22.00
Cash, March 26	$257.32

The Auditing Committee reported that they had examined the accounts and found them correct. On motion of Dr. Sapir, seconded by Dr. Cole, the reports of the Secretary-Treasurer were accepted and placed on file.

Dr. Sapir, Chairman of the Committee appointed by the President to suggest some method of utilizing the surplus funds of the Section, reported for the Committee. It was recommended that a sum, not to exceed $200.00, be expended from the Section funds, the money to be used in publishing some paper on work in the Central Section's territory, or a paper by some member of the Central Section. Dr. Faris moved that the report of the Committee be adopted, and the Committee discharged. On being seconded by Dr. Laufer, the motion was carried.

In considering the meeting place for 1928 the claim of Nashville, Tennessee, was considered. P. A. Brannon invited the section to hold its next meeting at Montgomery, Alabama. On motion of Dr. Faris, seconded by Mr. Olmstead, it was declared the sense of the meeting that Nashville should be the place but that the final selection should be left in the hands of the Executive Committee.

The bill introduced in the 69th Congress through the efforts of P. E. Cox, of Franklin, Tennessee, was discussed. The resolution in regard to this bill, proposed by Dr. Faris and seconded by Dr. Cole, was passed.

Resolved: That the Central Section does heartily endorse the bill in Congress known as H. T. 16919, and known as "A bill to provide for co-operation by the Smithsonian Institution with state educational and scientific organizations in the United States for continuing ethnological researches on the American Indians"; and that we urge upon our representatives in Congress the adoption of this bill.

And be it further resolved that Mr. Cox be notified of the endorsement.

The following resolutions reported by the Resolutions Committee were unanimously adopted by the Section.

Resolved: (1) That the Central Section of the American Anthropological Association spread upon its minutes an expression of thanks to the University of Chicago and to the Field Museum, and their staffs, for the courtesies and hospitality extended to its members during the present annual meeting. The unusual opportunities afforded by personal contact with the educational and museum centers of anthropology in the middle west, in the halls in which the Central Section was organized five years ago, are deeply appreciated.

(2) That the Central Section of the American Anthropological Association record its serious apprehension of the increasing menace of vandalism

of aboriginal remains in the United States, and its approval of any reasonable steps taken by its members to educate the public with regard to the proper preservation and scientific investigation of aboriginal remains and monuments.

(3) That the Central Section of the American Anthropological Association express to Dr. O. L. Schmidt its appreciation for his friendly interest in the Section, and our thanks for the present gift and for the many gifts in the past.

The report of the Nominating Committee placed the names of the following members as officers for the Section.

For President, Dr. Fay-Cooper Cole, Chicago, Illinois.
For Vice-President, Dr. Carl E. Guthe, Ann Arbor, Michigan.
For Second Vice-President, Professor J. E. Pearce, Austin, Texas.
For Secretary-Treasurer, George R. Fox, Three Oaks, Michigan.
For members of the Executive Committee: Dr. Ellsworth Faris, Chicago, Illinois; H. C. Shetrone, Columbus, Ohio; Charles E. Brown, Madison, Wisconsin; Dr. Charles R. Keyes, Mount Vernon, Iowa; Peter A. Brannon, Montgomery, Alabama.

It was moved by Dr. Laufer and seconded by F. W. Aldrich, that the report be accepted and that the Secretary be instructed to cast a ballot for each of the persons named for the office to which he was nominated. The motion prevailed. The Secretary cast such ballots.

The afternoon session convened at 2:10 P.M. M. Bernstein of Chicago presented a paper on "Recent Investigations in Hair." By weighing fifty centimeters of hair, ten strands each, five centimeters long, on a fine balance, differences in hair weight between Negroids, Mongoloids, and Caucasoids were detected. Differences within the races of the Caucasoid group showed a progressive increase in hair weight from the Nordics to the Mediterraneans. There was an indicated sexual difference of eighteen percent in hair weight, the male hair being found heavier and coarser.

Differences in hair weight are due to three causes: (1) differences in quantity of pigment present; (2) presence or absence of air bubbles; (3) differences in area of cross sections, i.e., coarseness of the hair. The sexual differences seem to be due to the difference in area of cross-section.

The hairs on different parts of the scalp of the same individual are nearly identical, though an occasional variation is found. The structure of the hair-shaft is nearly uniform, as indicated by measurements and weighings of different sections of the same hair.

Dr. Ellsworth Faris, in "The Psychology of Magic," endeavored to discover whether magical processes were the result of rationalized

reasoning, or whether rationalized reasoning resulted from the practice of magical processes.

In explaining the "Tone System of Grebo, a West African Language," Dr. E. Sapir introduced C. G. Blooah, a native of the Kroo coast, who aptly illustrated Dr. Sapir's points by demonstrating the use of tones in his native language.

In "Primitive Music and Musical Instruments," K. Kennedy, Sydney, Australia, not only discussed the methods and music of primitives, but with specimens collected in various parts of the world, he played the common airs best adapted to each instrument. The instruments used included, from Australia, the one-tone stick, the musical boomerang, and the bull-roarer; from the Melanesian islands, pan-pipes (Solomons), flute of human bone, wood-flute, and shell trumpet (Maori of New Zealand), a drum and shell trumpet (Fijis). Among the African sources of music he showed the marimba and the steel guitar; also the one-string bow, the Zulu harp-bow, and the Basuto musical bow. From China he exhibited and demonstrated the moon-guitar, the flute, and the Chinese fiddle; from Russia he had the balalaika.

Henry Field of the Field Museum, in "An Interesting Skull from Patagonia," illustrated, gave the salient points of a primitive type of skull found on plains of the southern Argentine.

The members of the Section were entertained at dinner and for the evening by a smoker at the rooms of the Adventurers' Club.

GEORGE R. FOX,
Secretary-Treasurer

PROCEEDINGS OF THE AMERICAN ANTHROPOLOGICAL ASSOCIATION FOR THE YEAR ENDING, DECEMBER, 1927

The American Anthropological Association held its twenty-sixth annual meeting at Phillips Academy, Andover, Massachusetts, on December 28, 29 and 30, 1927, in conjunction with the American Folk-Lore Society.

Three Council meetings were held with President Saville in the chair.

COUNCIL MEETING, DECEMBER 28, 8:00 P.M.

The minutes of the Philadelphia meeting were read and approved.

Report of the Treasurer

Receipts

Balance on hand, December 8, 1926			$2042.62
American Ethnological Society		$ 772.50	
Anthropological Society of Washington		195.00	
Central States Branch		318.50	
Annual membership dues of A. A. A.			
1924	$ 6.00		
1925	35.75		
1926	211.01		
1927	3056.85		
1928	257.00	3566.61	
Sale of publications		917.68	
Reimbursements		1498.61	
Interest		60.00	
Miscellaneous		38.63	
Special Memoirs fund		51.97	
			7419.50
			$9462.12

Disbursements

George Banta Publishing Company:			
Printing	$3403.76		
Postage	216.66		
Storage	60.00		
		3680.42	
Editor's expenses		587.65	
Treasurer's expenses		682.50	
Secretary's expenses		80.00	
Reprints		392.57	
Memoirs		1109.12	
Purchase of back numbers		18.00	
			6550.26
Cash on hand, Dec. 9, 1927			2911.86
			$9462.12

Resources

Cash on hand, December 8, 1927			$2911.86
Due from sales:			
1926	$ 1.50		
1927	151.30		
		$ 152.80	
Due from dues:			
1924	6.00		
1925	6.00		
1926	150.00		
1927	424.00		
		586.00	
			738.80
			$3650.66

Liabilities

Membership dues for 1928 already paid	$ 257.00	
Net excess resources over liabilities	3393.66	
		$3650.66

Cost of Publications

AMERICAN ANTHROPOLOGIST, vol. 29, no. 1		
Printing	$ 727.86	
Distribution	23.75	
Reprints	75.36	
	$ 826.97	
AMERICAN ANTHROPOLOGIST, vol. 29, no. 2		
Printing	737.28	
Distribution	35.48	
Reprints	83.72	
	856.48	
AMERICAN ANTHROPOLOGIST, vol. 29, no. 3		
Printing	1283.30	
Distribution	35.68	
Reprints	123.39	
	1442.37	
AMERICAN ANTHROPOLOGIST, vol. 29, no. 4		
Printing	655.32	
Distribution	44.58	
Reprints	91.42	
	791.32	

MEMOIRS, Number 33	749.05		
Distribution	8.31		
		757.36	
MEMOIRS, Number 34			
Printing	360.07		
		360.07	
Total			$5034.57
Reimbursements, American Anthropologist		389.49	
Reimbursements, Memoirs		1109.12	
			1498.61
Net cost			$3535.96

PERMANENT FUND

Receipts

Balance, December 8, 1926			$1668.81
Interest on Savings Account, Jan. 1, 1927	$ 24.26		
Interest on Liberty Bonds (3), Apr. 9	6.36		
Interest on Liberty Bond (1), May 13	2.13		
Interest on Savings Account, July 1, 1927	24.88		
Interest on Liberty Bonds (3), Nov. 2, 1927	6.39		
Interest on Liberty Bond (1), Nov. 30, 1927	2.12		
Difference between cost and redemption price of 2nd Liberty Bond	2.97		
			69.11
Total			$1737.92

Investments

Liberty Bonds		$291.09	
(FO3618566—4th)			
(GDOO93417—4th)			
(GO361856—4th)			
Treasury Saving Certificates		60.00	
(QO309572)			351.09
(QO309573)			
(QO309574)			
Cash in Savings Account			1386.83
			$1737.92

The financial situation of the Association improved during 1927. As compared with December 8, 1926, the balances are as follows:

Permanent fund:	1926, $1668.81; 1927, $1737.92
Regular fund:	1926, $2042.62; 1927, $2911.86
Memoirs fund:	1926, nothing; 1927, $51.97

The American Anthropologist for 1927 cost the Association $3527.00 as against $2722.00 for the 1926 volume. This increased cost is due to the addition of nine sixteen-page signatures and to the publication of many illustrations, most of which were paid for by the Association.

The Memoirs fund comes into existence through royalties received from the publisher of American Indian Life. The Memoirs are still being published through the generosity of friends of the Association. The annual income of the Association is sufficient to keep the American Anthropologist up to standard, but still insufficient to finance the Memoirs. Five hundred additional members would make possible the production of a Memoirs volume of six hundred pages per annum. The Treasurer suggests that the Council pass a resolution requesting each member to bring in at least one new member, and informing members that thereby a second annual volume of 600 pages can be supplied without any increase in dues. This resolution should be printed and mailed to each member.

The sanction of the Council is sought for the transfer of $1000.00 from the regular fund to the permanent fund of the Association.

Respectfully submitted,
E. W. GIFFORD, *Treasurer*

REPORT OF THE EDITOR

The 1927 volume of the AMERICAN ANTHROPOLOGIST, with 751 pages, approached the figure of 1915, though still considerably behind the 822 page record of the last 20 years set in 1909. The increase was made possible partly by the regular budget appropriation, partly by a financial contribution for the publication of an article that had already been accepted.

At the time of writing the first issue of 1928 is being paged. There is still tremendous congestion, and a number of articles have had to remain unpublished for well over a year. Often long contributions set up months ago and destined for a special issue have to be eliminated for the time being on account of lack of space. The relevant

editorial correspondence should some time be published *in toto* as a human document of no mean psychological value. May the Editor once more point out that the circumstances dictating such postponement are generally beyond his control?

The Memoirs continue to be published by means of private subsidies. Number 34, Noel Morss's "Archaeological Explorations on the Middle Chinlee, 1925," was financed by the author; Number 35, "The Northern and Southern Affiliations of Antillean Culture," by Charlotte D. Gower—now paged—is being printed through a contribution by the Central Section of the American Anthropological Association. A large memoir by Dr. E. C. Parsons on "The Social Organization of the Tewa of New Mexico" has been received and will be prepared for the press in the immediate future. The series is evidently being kept alive, but its hand-to-mouth existence is most unsatisfactory. For example, the Editor had to decline a valuable archaeological paper because its length disqualified it as an article and there was no general Memoir fund to draw upon.

The ANTHROPOLOGIST naturally remains strongest in the field of American archaeology and ethnography. In the 1927 volume it has been possible to give some space to contributions on Asiatic prehistory and ethnography, and there is one article on an African ceremonial. There is a lamentable dearth of theoretical discussions. On the other hand, something has been achieved in establishing contacts with other branches of science by occasionally soliciting reviews from biologists, economists, sociologists, etc.

As regards the technical problems of editorial work, arrangements have recently been made that will, it is hoped, ensure a maximum of efficiency without additional expense to the Association.

Respectfully submitted,
ROBERT H. LOWIE, *Editor*

It was moved and carried that the above report be referred for special consideration to a committee appointed by the chair (F. Boas, F. W. Hodge).

REPORT OF BUDGET COMMITTEE

BUDGET FOR 1928

Secretary's expenses		$100.00
Editor's expenses		600.00
Editor's assistant	$480.00	
Office expenses	120.00	

Treasurer's expenses		700.00
Treasurer's assistant	480.00	
Office expenses	220.00	
American Anthropologist		4080.00
Printing (47 16-page sign)	3000.00	
Illustrations	400.00	
Reprints	400.00	
Storage of back nos.	60.00	
Postage	220.00	
Reprinting back numbers		1000.00
Emergency Memoir expense		120.00
		$6600.00

(Signed) R. B. DIXON,
C. WISSLER

It was moved and passed:

That a committee (E. W. Gifford, R. H. Lowie) with power to act be appointed to inquire into the number of missing issues of the "American Anthropologist," and to arrange for the reproduction of these issues by photostat so that complete volumes of the "Anthropologist" may be available for sale.

That a communication from the Museum of the Peaceful Arts asking us to appoint representatives be laid on the table.

That in response to a communication from the Social Science Research Council explaining the proposed project for establishing a "Journal of Social Science Abstracts," and requesting that three representatives be appointed on the Advisory Committee, that the Chair be empowered to appoint such a committee (R. F. Benedict, F. W. Hodge, T. Michelson).

That a committee of three be appointed to act as official delegates of the A. A. A. at the International Congress of Americanists to be held in New York, September, 1928 (F.-C. Cole, A. I. Hallowell, W. Hough).

The editor of the Encyclopedia of the Social Sciences, in a communication enclosing a report of the progress made to date, suggested that the constituent associations take some financial responsibility, if possible, for this project. It was moved and carried that a letter stressing cooperation and moral support be transmitted to the editor,

but also pointing out that the American Anthropological Association was not in a position to raise money for the encyclopedia. It was also suggested by the editor that the traveling expenses of official representatives of each association be defrayed in order that they might attend the meetings. It was moved and carried that this was impracticable in the case of our own representatives.

A letter from Dr. A. L. Kroeber was read, in which he called attention to the fact that in New York City there was an organization which was apparently dealing in semi-pornographic literature, which called itself the *American Anthropological Society*. Professor Kroeber expressed concern lest this organization be confused in the public mind with the American Anthropological Association. After some discussion as to practicable action it was moved and carried that this matter be laid on the table.

Dr. A. M. Tozzer spoke of a project under way which aims at providing a series of Source books on the history of the Sciences. He is in charge of the volume on anthropology and requested the endorsement of the Council. This was granted and Dr. Tozzer was empowered to select a non-official committee to work with him on the matter.

It was proposed by Dr. Boas that, in view of the financial support now being given by the various foundations having led to all sorts of scientific research, that the A. A. A. organize advisory committees on archaeology (H. J. Spinden), ethnology (F. Boas), physical anthropology (E. A. Hooton) and linguistics (E. Sapir), and advise these foundations that such committees stand ready to give advice on matters pertaining to research.

Council Meeting, December 29, 9:30 a.m.

Dr. Leslie Spier drew attention to the situation in connection with the American Year Book, a commercial corporation. He suggested that the American Anthropological Association withdraw its official connection with this project. Dr. MacCurdy explained his connection with the Year Book, and stated that he had been appointed official representative a number of years ago, but that Dr E. A. Hooton wrote the article in the last Year Book. Dr. MacCurdy asked that his resignation as a member of the Supervisory Board and as a contributor to the Year Book be accepted. This request was carried with regrets. The Chair was empowered to appoint a committee (A. V. Kidder, L. Spier) to look into the connection of other

organizations with the Year Book, and with power to act in respect to the whole matter.

A telegram was received from B. E. Livingston stating that the next meeting of the A. A. A. S. would be held in New York. It was moved and carried that the place of meeting of the A. A. A. be left to the discretion of the Executive Committee.

A telegram was received from Professor Horace Secrist requesting that three representatives of the A. A. A. be appointed to cooperate with similar committees from other sciences, acting under the auspices of the Committee on Scientific Method of the Social Science Research Council. A project is under way to select outstanding contributions in the several sciences suitable for case analysis from the standpoint of methodology. The Executive Committee was empowered to act on this matter after getting more details (R. H. Lowie, Chairman).

Dr. R. B. Dixon, as one of our representatives to the Social Science Research Council, made a brief report.

It was voted that the American Anthropological Association give its cordial support to the project of Miss A. E. White in exhibiting objects of Indian art in Paris, and appoint Dr. H. J. Spinden as its official advisor.

It was voted that a committee be appointed, consisting of Dr. Wissler as chairman (A. M. Tozzer, F. G. Speck) and to include the chairmen of departments engaged in teaching anthropology, to consider the question of approaching the Foundations for financial aid in supporting the field work for graduate students.

Dr. A. V. Kidder gave a brief report of his activities as retiring chairman of the Division of Psychology and Anthropology of the National Research Council. He gave particular emphasis to the State Survey Committee, studies proposed of the anthropology and psychology of the Negro, the establishment of a Museum and Laboratory of Anthropology at Sante Fé, the Committee on Child Development, and the index prepared of the "American Anthropologist." The printing of the latter is deferred until the completion of the next volume. It was voted by the Council to express to Dr. Kidder their appreciation of his energetic and efficient activities. There was a brief discussion in respect to the advisability of continuing the grouping of Psychology and Anthropology in the National Research Council. Dr. Kidder pointed out that several other Di-

visions contain representation from a number of sciences, and that it does not seem practicable to make a change at the present time.

Council Meeting, December 29, 8:00 p.m.

It was moved and carried that a new Program Committee (P. E. Goddard, J. R. Swanton, and E. A. Hooton) be appointed. It was also voted that the following suggestions be carried out:

(1) that the entire first afternoon be devoted to a session of the Council,

(2) that the first session be made up of short papers of not more than ten minutes each in which methods and results be emphasized instead of data,

(3) that topics of Physical Anthropology be included in the program of the American Anthropological Association next year, since it does not seem wise to imply a dichotomy between physical anthropology and ethnology.

It was voted that a hundred extra copies of the "American Anthropologist," above the mailing list, be printed for each issue.

Dr. W. K. Moorehead discussed the present situation in connection with the administration of the Department of Indian Affairs due to the fact that an "Indian" has never been defined. He has been working over this problem and has solicited a number of definitions from various anthropologists. Some of these were read, and there was an informal discussion.

Annual Business Meeting, December 30, 9:30 a.m.

The following list of officers and representatives of the A. A. A. was presented by the Nominating Committee (J. M. Cooper, R. B. Dixon, A. E. Jenks, O. Ricketson, A. M. Tozzer), accepted by the Association, and duly elected.

President: M. H. Saville.
First Vice-President: A. V. Kidder (2 years).
Second Vice-President: Fay-Cooper Cole.
Secretary: A. Irving Hallowell.
Treasurer: E. W. Gifford.
Editor: R. H. Lowie.
Associate Editors: E. W. Gifford, F. G. Speck.
Executive Committee: N. M. Judd, J. A. Mason, Gladys Reichard.

Council (new members): T. Adamson, L. Bloomfield, R. L. Bunzel, B. Cosgrove, D. S. Davidson, H. Field, M. Jacobs, W. Jochelson, T. F. McIlwraith, G. G. MacCurdy, M. Mead, Mrs. O. Ricketson, G. Vaillant, A. Elizabeth White, L. A. White (1931).

Council: H. Bingham, E. W. Gifford, C. H. Hawes, D. Jenness, Rachael W. Lothrop, J. A. Mason, W. C. Mills, C. B. Moore, W. K. Moorehead, N. C. Nelson, C. Peabody, E. C. Parsons, E. K. Putnam, E. Sapir, F. H. Saville, M. H. Saville, H. I. Smith, H. Webster, C. C. Willoughby (1931); S. A. Barrett, M. W. Beckwith, R. Benedict, F. Blom, D. Cadzow, C. B. Davenport, E. S. Goldfrank, G. B. Grinnell, E. Gunther, A. I. Hallowell, M. J. Herskovits, A. E. Jenks, N. M. Judd, F. La Flesche, R. Linton, J. H. MacGregor, B. Oetteking, A. C. Parker, G. Reichard, R. J. Terry (1928); R. T. Aitken, C. M. Barbeau, R. B. Bean, S. B. Collins, B. Cummings, S. Hagar, G. G. Heye, E. A. Hooton, B. T. B. Hyde, A. B. Lewis, S. K. Lothrop, S. G. Morley, J. E. Pearce, F. G. Speck, L. Spier, H. J. Spinden, F. Starr, W. D. Wallis, H. N. Wardle, H. H. Wilder, H. Shapiro, H. W. Krieger, O Ricketson, G. A. Dorsey, D. J. Morton (1929); G. Engerrand, W. Gates, P. E. Goddard, S. J. Guernsey, C. E. Guthe, H. U. Hall, E. S. Handy, C. L. Hay, J. P. Harrington, M. R. Harrington, L. W. Jenkins, A. V. Kidder, T. Michelson, W. F. Ogburn, B. F. Chappelle, J. B. Stetson, A. M. Tozzer, S. Trotter, E. P. Wilkins, W. Bradfield, E. H. Morris, T. W. Todd, F. H. H. Roberts, Jr., J. M. Cooper, W. K. Gregory, H. C. Shetrone (1930).

Representative to the Social Science Research Council: P. E. Goddard (to serve from April 1, 1928–April 1, 1931).

Representatives to the National Research Council: J. M. Cooper, J. A. Mason (to serve for three years from July 1, 1928).

Representatives to Section H, A. A. A. S.: H. J. Spinden, C. E. Guthe.

(The names of new members elected to the Association will appear in the forthcoming membership list which will be published in the AMERICAN ANTHROPOLOGIST for 1929).

The following resolutions were offered and passed:

(1) Be it resolved that, whereas, from the palaeontological and cultural data already at hand, gathered at the site and presented by competent experts at our annual meeting, December 28–30, 1927, the American Anthropological Association believes the Folsom, New Mexico, so-called "Bison quarry," holds most promising evidence in the disputed field of early man in America.

Because of this belief, the American Anthropological Association respectfully urges that a Quadrant covering this present unsurveyed site be undertaken at the earliest date by the U. S. Geological Survey in order to establish the geological age of the deposits in which these remains are found.

(2) Be it resolved that the American Anthropological Association express its appreciation and hearty thanks to the Principal and Board

of Trustees of Phillips Academy, and to Dr. W. K. Moorehead and Dr. A. V. Kidder for the cordial hospitality extended to them at Andover.

Program

Four general sessions of the A. A. A. were held. At the opening session the following papers were presented:

Carleton S. Coon, Preliminary Report on the Riffians.
Walter B. Cline, Preliminary Report on the Inhabitants of Siwâh Oasis.
Leslie A. White, A Summary Report of Field Work at Acoma, N. M.
V. J. Fewkes, New Phases of the Palaeolithic Cultures of Moravia, Czecho-Slovakia.
W. K. Moorehead, Cooperation in America Archaeology.
E. W. Gifford, Kingship and the Family in Western Polynesia.
Ralph Linton, The Origins of Madagascar Culture.

The other meetings were devoted to symposia on the following subjects:

(1) The Antiquity of Man in America. Chairman, R. B. Dixon.
Recent Finds near Folsom, N. M., F. H. H. Roberts.
The Archaeological Evidence as a Whole, N. C. Nelson.
The Evidence from Physical Types, H. L. Shapiro.
Geological Aspects, F. B. Loomis.
Palaeopathological Aspects, H. U. Williams.

(2) Chronology and Culture-Sequence in America. Chairman, H. J. Spinden.

1. The Archaic Civilization; Its Extent and Significance.
A Neo-archaic Classification. S. K. Lothrop, G. Vaillant.
2. Extensions of the Maya Cultural Horizon. H. J. Spinden, A. V. Kidder, J. A. Mason.
3. Cultural Succession in Peru. A. L. Kroeber.

(3) The diffusion of Culture Traits. Chairman, Clark Wissler.
Diffusion in the Pacific Area, T. F. McIlwraith.
Diffusion in Archaeology, N. C. Nelson.
Diffusion in General, R. B. Dixon.

A. Irving Hallowell, *Secretary*

DISCUSSION AND CORRESPONDENCE

In Re Jacob's Cavern

Two entirely dissimilar modes of thought are manifest in Mr. Nelson's and my own discussion of the Jacob's Cavern finds (see American Anthropologist, n.s., 30: 329, 1928). The results expressed in the Jacob's Cavern paper are the outcome of chemical, physical, and geological examination of the carved "mastodon" bone and the cavern deposits. Whether the conclusions reached are true or not is a minor consideration; they do not rest upon mere personal opinion. The methods employed are not inherently mysterious; they are described in detail so that they who wish may reproduce them or, if they are so constrained, draw other conclusions from the data presented.

There is little pertaining to the carved bone which an anthropologist or archaeologist is, by training, capable of handling. The effective approaches to this problem are indirect but susceptible of repetition by others possessing similar technique. Mr. Nelson's professed ability to discredit this "mastodon" bone is for this reason strongly questioned. He misconstrues the note at the back of the paper as an attempt to rehabilitate this carved bone; so far this bone has not required "rehabilitation"; it merely lacks extremely obvious and undisputed authenticity.

It is unfortunate that Mr. Nelson's careful labors in trenching Jacob's Cavern should have yielded such disappointing results but this is merely a part of the problem to be solved. His objections will again be answered in detail, however:

1. Admitted by all concerned.

2. The surviving bone was mineralized; this is shown by X-Ray photographs and specific gravity determination. Consider the possibility that the other carved bones and shell were not so preserved; they are reported to have disintegrated. The only other mineralized bone fragment so far found in this cavern was in the third layer.

3. Authorities pronounced the bone fragments from layer 3 as typical Late Pleistocene. Where does "Late Pleistocene" shade into "Recent"?

4. Why assume the bone to have been perforated for suspension? Also, is it not possible that at least one American type culture has escaped the notice of our diligent archaeologists?

5. The perforation in the carved bone can be attributed equally well to a tapered stone drill or a knife. In any case, the fabrication of such a perfora-

tion would be difficult after mineralization; such a bone would probably be well protected from accumulation of foreign substances while in use; it was probably mineralized during a long (relatively) period of disuse. Again, why assume that the carved bone was ever carried suspended from a cord?

6. Why assume that the carved bone was ever subject to much wear or abuse?

7. The field of American archaeology perhaps may not be considered to have been thoroughly covered. Moorehead and Peabody found no carved bones and also found no mineralized bone fragments in Jacob's Cavern.

8. The cross-section of the carved bone, as usual with most bones, is roughly elliptical and also, as usual with most bones, almost all the weathering cracks are on the more sharply curving parts of the ellipse. The unknown artist had the amazing forethought to place his carvings upon the flatter part of the ellipse—probably because of the greater ease of carving. This may be the reason that most of the weathering cracks "miss" the carvings.

9. The color of the artificial incision surface is very similar to the color of the bone surface itself in a recent carving upon an old bone. The outer part of a bone is somewhat different in composition from the inner part of a bone and the same amount of weathering would be expected to give different results with two differing substances.

10. The bone is mineralized and mineralization preserves a bone quite well. The great difficulty of carving a mineralized bone leads to the thought that possibly the "mastodon" bone was carved before the bone was mineralized.

11. A broad statement from any but an expert in the carving of bones with flint tools. I, an amateur carver, made fair copies of the "mastodon" upon both an old bone and a green bone and the edges of the carvings are fairly sharp, especially in the case of the green bone. I used flint points from Jacob's Cavern and employed the scraping method.

Favorably situated stalagmites accessible to the outside air with its seasonal variation in dust content record the dusty season as a darker layer and the wet (or less dusty season) as a lighter layer. Such layers are not due

to the fact that the early cave occupants were thoughtful enough to sprinkle some kitchen refuse on their calendar.

The great amount of "kitchen refuse" in the upper part of the stalagmite interferes with the deciphering of the annual layers. The bottom part of the stalagmite is too complex to yield easily to counting its annual layers; traces of a "splash cup" are seen,—evidence of a period of much greater rainfall than today. Careful inspection shows, however, that annual layers are present in the bottom part of the stalagmite. The absence of the opportunity to count these layers leads to their calculation in the best way possible. The photograph

of the enlarged layers on page 311 of the Jacob's Cavern paper shows some half dozen consecutive, quite uniform, layers—rather regular, sporadic rainfall records. The means employed in the attempt to synchronize the Jacob's Cavern stalagmite growth curve and the California redwood growth curve are on record, and they who disagree are free to bring forth contrary evidence if they possess such. In an estimate or calculation of this type with its obvious difficulties it is just as well to say "1213 years" as "about 12 centuries" or to say "730 B.C." as "about the 8th century B.C." It avoids cluttering up the main theme and enables its more complete grasp. Such a device antagonizes only those who are gun-shy of any but vague generalizations.

The third layer is evidenced visually, physically, and chemically. Whether it is a catch basin marginal to a central mound of occupation material is a conjecture, the truth of which will only be known after the complete excavation of the cavern deposits in the presence of men capable of recognizing such things. The second layer indicated absence of cavern occupation (by man or other animal) by the absence of decomposed bone material. This second layer appears to have been a red clay layer probably washed down into the cavern through the sink-hole originally responsible for the formation of the cavern; this layer is in such quantity as to indicate a considerable period of time for its deposition or accumulation. Therefore, if such were the case, whatever the origin of the third layer, it was deposited before a period of moisture-fall greater than that of today and preceding the deposition of the ash layer in the cavern. And such a rainy season or period has not since occurred to wash the ash layer over to the edges of the cavern. And also this third layer yielded a piece of mineralized bone,—the only other such fragment found in the cavern was the "mastodon" bone.

The presence of the reduced iron and relatively large phosphorus content of layers 1 and 3 and their absence in layers 2 and 4 may be safely attributed to animal remains. The statement that

this chemical composition can doubtless be explained in other ways

shows a complete and active unfamiliarity with such matters. The presence of fire-burnt rock fragments in this third layer, 7 meters back from the front of the cavern, is not evidence against human occupation.

It has been the reported experience of those digging in Pleistocene deposits that practically all bones preserved are, at the moment of

discovery, surprisingly well preserved. But were all Pleistocene bones preserved?

The anthropologist examines and interprets evidence bearing on his problems. The chemist and physicist not only examines and interprets such evidence but also records this evidence so that others may examine and interpret at their leisure.

Two of the set of three bones examined photographically and physically are of the Virginia deer and from the left front leg (consensus of opinion of a number of authorities). No fresh left front leg bones of the Virginia deer were available for the third bone. The two bones which I carved were not treated with "hard oil" before impregnation with paraffin because when the "mastodon" bone was melted out of the paraffin block (in which it was embedded after the other carved bones and shell had disintegrated) by the present writer, in the presence of Dr. Clark Wissler, the layer of "hard oil" peeled off with the hot paraffin; apparently it had not penetrated the "mastodon" bone very far,—because the "mastodon" bone was mineralized.

The fairly old bone (bone A, from the bottom of the ash layer) is of the same color, under several definite wave lengths of light, as the "mastodon" bone; they must have an approximately similar past history.

Bone A contains a recent carving upon an old bone. Yet the incision surface of this carving contrasts much less with its bone surface than does the carving on bone B and bone B is also old. The carving on bone B is thus obviously not a recent carving. Recent three-color process photographs of the three carved bones (Agfa Farbenplatten) confirms the panchromatic plate results.

Let us hope that eventually Jacob's Cavern will be completely excavated under competent supervision. This was largely the reason for the publication of the Jacob's Cavern paper.

VERNON C. ALLISON

This discussion would seem to have reached its natural end. Additional comment on my part would add little of importance. The student who will read Dr. Allison's original paper and my criticism should be able to draw his own conclusions. In my judgment the chemical test has not proved the engravings on the Jacob's Cavern bone to be ancient; but even if it had done so, all the circumstances surrounding the discovery of this bone are such as to warrant placing

it forever in the list of doubtful evidence. As to what concerns the stalagmite and the chronology Dr. Allison rears upon it, there seems to be nothing left to say except that neither science nor history has anything to gain by pretending to objective and numerical determinations which have no real foundation in fact.

N. C. NELSON

A DANISH CONTRIBUTION TOWARDS THE COMPREHENSION OF ESKIMO CULTURE

More than two hundred years ago Denmark began her great work of colonization in Greenland and, in the years which have gone by since the landing of Hans Egede in 1721, the population of the country has passed through a development from Stone Age people to a mixed Danish-Eskimo race under forms which have undoubtedly been unique anywhere in the world. Behind all this work lies the respect of the Danes for the national culture of the Eskimo; for simultaneously with the establishment of the trading stations and the development of practical occupations for the benefit of the future of the Eskimo, not only have scientists, but also zealous officials, employed under the Colony management, shown such great interest in the prosperity of this great Arctic colony that one may point with pride to a literature which, describing land and people, dates right back to the very first years. The scientific expeditions which travelled about and described Greenland and the Greenlanders must in no way be underrated; but it must be acknowledged that their road was very often opened for them by those men who, through generations, lived in the country and were sympathetic towards the problems which in turn arose.

The Commission for the Direction of the Geological and Geographical Explorations in Greenland, which by means of its imposing series of publications has brought Danish Arctic exploration to the knowledge of countries abroad, has now sent out a *Dictionary of the West Greenland Eskimo Language*,[1] compiled by the well-known Greenlandic lecturer, Schultz-Lorentzen, who has spent almost a lifetime in North and South Greenland as a minister and seminary principal. This dictionary, which is the first completely compiled dictionary of an Eskimo dialect ever translated into English, supplies a long-felt want and therefore may claim some further mention.

The *Dictionary of the West Greenland Eskimo Language* is a some-

[1] Published by C. A. Reitzel, Copenhagen, in 1927.

what revised edition of the Greenland dictionary published by the same author in Copenhagen in 1926, an extremely valuable and instructive work, the result of collaboration between Danes and Greenlanders, but particularly Danish ministers of religion who have placed their observations and collections of words at the disposal of the author, who has had valuable assistance in the person of the well-known Greenland minister and writer, Hother Ostermann. The preparatory work was commenced as far back as 1911 by the then lecturer in Greenlandic, Christian Rasmussen, in collaboration with the author.

Danish interest in the Eskimo language is of old date. As early as 1656 the first linguistic notes made their appearance, but it was not until 1750 that the first Greenland dictionary was published by Poul Egede. Schultz-Lorentzen's dictionary is the fourth of the series and, as the author says in his preface, is not only based upon the previous publications such as Fabricius in 1804, Kleinschmidt in 1851, and Chr. Rasmussen's Supplement in 1893, but much has also been taken from old and new Greenland literature. To one who, having a knowledge and love for the Greenland language, goes through the book, it gives nothing but pleasure to see the manner in which the living language is represented in this dictionary. To a most excellent degree the author has succeeded in raising his work above the usual dry listing of words and has, in the space allowed him, given a wealth of apt examples of colloquial speech.

The book, one of 300 pages of large format and got up in a beautiful and dignified manner, will undoubtedly become a very popular handbook in a short time, not only with foreigners who wish to familiarize themselves with the difficult Greenland dialects, but also with Greenlanders who feel a desire to learn foreign languages. Considering the rapid development of culture during the past half generation, the dictionary will certainly have its great and particular mission among the native population.

It is a special pleasure to the writer of these lines to draw attention to this interesting work. After almost twenty years' study of Eskimo culture in Greenland, it fell to my lot from 1921 to 1924 to lead the Fifth Thule Expedition, which carried us to the Canadian and to the American and Siberian Eskimo. No one can have a deeper respect than we Danes for all that we owe to explorers in these lands, a long list of weighty, sometimes pioneer names, which have helped to give vitally important contributions towards the understanding of one of

the world's most interesting peoples, the Eskimo, who live scattered over half the periphery of the world, right from the coasts of East Greenland to the regions round East Cape, west of the Bering Strait. The reason why we Danes have nevertheless ventured beyond our own domains is, first and foremost, that we have felt a desire to form an independent view of Eskimo culture as it is expressed in other parts of the world. And behind this desire is not only the interest in that which others did before us, but, perhaps more than anything else, love and respect for the bravest, the hardiest, indeed the most admirable of all primitive hunter races.

A Dane who has devoted himself to Greenland and the Eskimo lays a whole life's work before English readers in this book. May the book therefore secure an interested and sympathetic reception abroad, and also encourage a continued, penetrating study of Eskimo life and Eskimo culture in the countries that bear the responsibility of the development and future of this people.

KNUD RASMUSSEN

ANTHROPOLOGICAL NOTES AND NEWS

An Announcement Regarding the New Journal of Abstracts in the Social Sciences

The Social Science Research Council announces plans to establish a *Journal of Abstracts in the Social Sciences*. These plans are the result of five years' study by a committee of the Council which has canvassed the situation with respect to the needs, resources, and purposes to be served by a comprehensive abstract service in the social sciences.

A substantial subsidy has been provided for a period of ten years until the journal has become self-supporting through subscriptions.

In its report to the Council at Hanover, New Hampshire, in August, 1927, the Committee on Social Science Abstracts stated the need for abstracts in the following paragraphs:

"The founding of the Social Science Research Council is itself a recognition of the fact that leaders in the social sciences are convinced that research in these disciplines is greatly in need of stimulation and direction, and farther, that the scholars in these fields should be brought closer together for the consideration and solution of common problems. On the other hand, the deliberations of the Committee on Social Science Abstracts, and much of the information gathered by it, clearly bring out the fact that one great obstacle to the doing of truly scientific research in these fields lies in the tremendous mass of the materials to be considered and in the relative, if not quite complete, lack of appropriate tools for attacking it. There are so many books, pamphlets and reports constantly being published and so many periodicals both scientific and semi-scientific steadily pouring from printing houses both here and abroad, that it is physically impossible for any one to keep abreast of all the literature even in his own special field of work. For this reason also, and in making a courageous effort to read what he should, he is likely to take first the publications obviously in his own special field, and for lack of time to do more, to become increasingly oblivious of what is being done in other disciplines upon the same subjects. Thus artificial departmental lines tend to become sharper, and in his mind the social sciences stand as distinct and separate fields.

"To overcome these difficulties, a journal is proposed which will save an almost infinite amount of time and labor on the part of research workers, by giving them in one journal complete citations and

short but objective abstracts of all important new materials, and will at the same time draw together the several disciplines by serving them all through one journal based upon some systematic classification and improved by numerous cross-references to the materials in other fields. Other important advantages of such a publication could easily be stated. It will save much duplication and waste of effort, it will apprise the worker of the existence of other specialists working on his problems and stimulate correspondence between them, it will call attention to new methods of research, it will serve as a permanent record of the work already accomplished, and will in many other ways promote the healthy development of the sciences to which it relates."

The Social Science Research Council has appointed an Organizing Committee consisting of the following scholars, and charged with the responsibility of organizing and establishing *Social Science Abstracts*: Dr. Isaiah Bowman, American Geographical Society; Dr. Davis R. Dewey, Editor of the American Economic Review; Dr. Carlton Hayes, Professor of History, Columbia University; Dr. Frederic A. Ogg, Editor of the American Political Science Review; Dr. Frank A. Ross, Editor of the Journal of the American Statistical Association; Dr. Clark Wissler, Professor of Anthropology, Yale University; and Dr. F. Stuart Chapin, chairman, Professor of Sociology, University of Minnesota.

To assist the Organizing Committee, a number of advisory committees have been appointed in the fields of cultural anthropology, economics, history, human geography, political science, sociology, and statistics. These advisory committees have been asked to suggest: (1) the names of scholars who may be considered for the position of salaried editors and unsalaried consulting editors; (2) to draw up a scheme of classification adequate to the needs of the systematic grouping of materials from their respective fields of specialization within the social sciences.

Since the Council is made up of delegates from the national learned societies in the fields of anthropology, economics, history, political science, psychology, sociology, and statistics, the purposes of the Council in its efforts to further cooperative scientific research in the social sciences is best served by devoting *Social Science Abstracts* to the fields of cultural anthropology, history, human geography, political science, sociology, and statistics, broadly construed.

Social Science Abstracts will be issued monthly during the year and in each issue will appear systematic abstracts of new information

published in the fields indicated for the preceding month or months. *Social Science Abstracts* will be printed in English in this country, but it will attempt to cover the social science literature of the world as originally published in all languages.

Negotiations are under way to establish a satisfactory basis of cooperation with the Committee on Intellectual Cooperation of the League of Nations, in working out a modus operandi with the arrangements for economic abstracts undertaken by this international organization.

The test of published materials to be abstracted will in general be the criterion of *new information*, in the sense of important factual studies and contributions to theory and opinion, in the fields of the social sciences indicated. This will require the careful scrutiny of articles in periodicals, pamphlets, bulletins, monographs, and new books. It is conservatively estimated that the annual number of abstracts will run to fifteen or twenty thousand titles the first year. The abstracts will be cross-referenced and annual indexes published. It is hoped that the first number of *Social Science Abstracts* may be published within the present calendar year.

F. STUART CHAPIN,
Chairman of the Organizing Committee

SOCIAL SCIENCE RESEARCH COUNCIL

The Social Science Research Council announces the appointment of twenty-one Research Fellows for the year 1928–29. The fellowships are in the fields of anthropology, economics, human geography, political science, law, psychology, sociology, and history. Fourteen universities, from Oregon to Harvard, are represented by the Fellows selected, and the latter will gather their material from all parts of the globe. A geographer will study rural communities in Japan, an anthropologist will investigate the problem of adolescent and child psychology in a South Sea island; another the adjustment of individuals to society in a Pueblo village; a third anthropologist the background of Chicago immigrants in Sicily; a political scientist will study the problem of contemporary political leadership in the light of psychiatry and psychology; a psychologist is going to England and the Continent to study current work in the psychology of industry with particular reference to industrial morale.

The fellowships are granted to young American investigators, both men and women, of outstanding promise in the social sciences.

All are under thirty-five years of age and have received the doctor's degree.

Following is the list of Fellows in Anthropology and their research problems:

Ruth L. Bunzel (Columbia University): "Social Adjustments in a Primitive Pueblo Community." Place of study: New Mexico.

Charlotte Day Gower (Institute for Juvenile Research, Chicago): "An Ethnological and Sociological Study of a Typical Sicilian Village Community as a Contribution to the Background of the Problem of the Sicilian Immigrant to the United States." Place of study: Sicily.

Margaret Mead (American Museum of Natural History): "The Mental Development of Young Children among a Primitive People." Place of study: Melanesia.

XXIII International Congress of Americanists

The XXIII Session of the International Congress of Americanists will be held in New York during the week beginning September 17th, 1928. The subjects which will be considered are the following:

1. The races of America and their relationship to other peoples.

2. The archaeological remains found in America and time relations as revealed by them.

3. The habits and customs of the various groups of American Indians and questions of the origin and distribution of these in the old and new worlds.

4. The native languages of America.

5. The early history of America, especially in regard to its discovery and early settlement.

6. Geographical and geological questions, especially as related to human activities.

The Congress will meet as a whole once each day to consider papers of general interest which will be communicated by eminent authorities. For the hearing of more special papers, which will be limited to twenty minutes each, the Congress will meet in sections. The titles of the papers and abstracts should be in the hands of the Secretary not later than June 1, so that a definite program may be arranged and mailed to members in advance of the meeting.

Individuals who wish to be enrolled as members or associate members are requested to mail applications for membership to George

G. Heye, Treasurer. Checks covering the membership fee may be enclosed with the application for membership.

Libraries and other institutions should become members if they wish to receive the report of the Session in which the papers read will be printed.

For the Committee of Organization
FRANZ BOAS, *Chairman* P. E. GODDARD, *Secretary*

A PREHISTORY CHART

Professor A. E. Jenks, of the Department of Anthropology at the University of Minnesota, has designed a chart illustrative of the chronological sequences of archaeological periods in prehistoric Europe and of typical artifacts of each period. The dimensions of this chart are three feet by four feet. The upper half is devoted to a chronological diagram of culture sequences in which the various glacial advances are represented by peaks and the interglacial periods by valleys. The associated cultures are distinguished by the varied colors of the different portions of this Pleistocene range. The several types of fossil man have their positions in the landscape indicated by guide posts.

The lower half of the chart shows drawings of characteristic implements of the successive periods, excellently delineated and clearly labelled. The selection of artifacts representative of the Palaeolithic periods is very good. Limitations of space prevent an equally satisfactory display of objects characteristic of the Neolithic, Bronze, and Early Iron Ages. Nearly all of those represented on the chart come from the Scandinavian area. But the author has chosen carefully and well.

Teachers of history and of prehistoric archaeology will find that Professor Jenks's chart is a valuable aid to themselves and to their students. Ten minutes' study of this chart will fix in the mind of the reader facts which ordinarily require for their absorption hours of concentration and much thumbing of leaves of text-books.—*Science.*

"AFRICA," A NEW JOURNAL

The International Institute of African Languages and Cultures, formally constituted in June, 1926, has sent us the first issue, January, 1928, of the new journal, "Africa," devoted to African ethnography and linguistics. The ethnological work will be under the direction

of Mr. Henri Labouret (Paris), while Professor Westermann (Berlin) is in charge of linguistics. Two series are contemplated by the Institute, in addition to the journal, one of them to contain monographs, the other to comprise texts written or dictated by Africans in their native tongue. Among the contributors to the first and future issues we note the names of: Karl Meinhof; E. M. von Hornbostel; J. H. Driberg; R. Sutherland Rattray; Paul Schebesta; Alice Werner; Edward Sapir; Winifred Hoernle. "Africa" is published by the Oxford University Press, the subscription being one £1 2s. It can be ordered from the publishers or the offices of the Institute, 22 Craven Street, London, W. C.

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ON THE EVENING of February 21st, at a meeting of the American Geographical Society of New York, the Charles P. Daly gold medal of the society was presented to Professor Alois Musil, of Charles University, Prague, in recognition of a lifetime devoted to explorations in northern Arabia and Mesopotamia and to historical researches relating to this part of the world.

Professor Musil has made an extremely important contribution to our knowledge of Bedouin folklore. Accepted as a member of the Rwala tribe, on equal terms with their head chief, he was enabled to study the life of these nomads in its minutest details. He records, translates, and explains several hundred of their songs in his volume, "The Manners and Customs of the Rwala Bedouins," to be published by the American Geographical Society in 1928.—*Science.*

MR. LESLIE A. WHITE, who recently received the doctor's degree in anthropology at the University of Chicago, is now teaching in the Department of Sociology and Anthropology at the University of Buffalo.

NEIL M. JUDD, curator of American archaeology, United States National Museum, returned to Washington on December 6, after six months' field work for the National Geographic Society at Pueblo Bonito, a prehistoric Indian village in northwestern New Mexico. The past summer marked the seventh and concluding season of the society's explorations at this most remarkable of all the pre-Hispanic pueblos of the southwest. Mr. Judd is now engaged upon preparation of his final reports to be published by the society.—*Science.*

THE SOCIÉTÉ DES AMÉRICANISTES DE BELGIQUE announces the publication in the near future of Paul Minnaert's "Les Institutions

et le Droit de l'Empire des Incas," to be published by Philippe Moens, 58, Rue Veydt, Brussels. The subscription price is to be $3.00.

THE BOARD OF NATIONAL RESEARCH FELLOWSHIPS inthe Biological Sciences announces the appointment of F. E. Clements in Anthropology.

DR. OYARTZUN, curator of the Anthropological Museum, Santiago, Chile, has been awarded the gold medal of the University of Würzburg.—*Science.*

A SERIES of four addresses on the general subject, "The Measurement of Mankind," were delivered under the auspices of the Minnesota chapter of the Society of the Sigma Xi. These lectures were as follows: February 16, "The Measurement of Man in the Mass," Professor J. Arthur Harris; March 7, "Body Growth in Infancy and Childhood," Professor R. E. Scammon; March 28, "Normal and Abnormal Human Types," Professor C. M. Jackson; and April 18, "Mental Development in Relation to Physical Development and Types," Professor D. G. Paterson.—*Science.*

AN ARCHAEOLOGICAL EXPEDITION sponsored by Captain Marshall Field has gone to British Honduras to seek new facts concerning the ancient culture of the Mayas and to collect material illustrating their civilization for exhibition in the Field Museum of Natural History. The expedition has for its leader J. Eric Thompson, assistant curator of Mexican and South American archaeology at the museum. Its center of operations will be Belize.—*Science.*

PROFESSOR MALINOWSKI, who was recently appointed to the chair of anthropology in the University of London, was the chief guest at a luncheon given at the Lyceum Club on January 28 by the Polish Circle.—*Science.*

DR. ALEŠ HRDLIČKA, of the U. S. National Museum, Washington, D. C., lectured in Chicago on January 24, before the Chicago chapter of the Sigma Xi, on "The Glacial Age and its Relation to Man"; on January 25 and 26 at the University of Chicago, on "Origin and Evolution of Man in the Light of the Latest Knowledge" and "The Lessons of Human Evolution"; on January 27 before the downtown science group on "Human Evolution—Past, Present and Future." —*Science.*

MR. HARLAN I. SMITH was in British Columbia again last May, collecting from Indians, making motion pictures in southern British Columbia, and excavating shell-heaps on the north coast.

THE WÜRTTEMBERG VEREIN FÜR HANDELSGEOGRAPHIE UND FÖRDERUNG DEUTSCHER INTERESSEN IM AUSLANDE has recently published a pamphlet of annual reports for the period 1911–1926 (Strecker & Schröder, Stuttgart, 1927). It contains, in addition to the reports of activities, an obituary notice of Professor Koch-Grünberg and an article by Dr. F. Burger, entitled, *Beiträge zur Kenntnis der Völkerkunde der malaiischen Inseln*. This contribution contains a description of the author's collections in the Kei and Banda islands. The publication is well illustrated.

THE MUSEUM OF THE UNIVERSITY OF PENNSYLVANIA, in Philadelphia, has just been given a collection of Chinese art as a memorial to the late George Byron Gordon. Dr. Gordon had been connected with the University for many years and had been the director of the Museum from 1910 until his death last year.

A PAPER by Miss Frances Densmore on the music of the North American Indian was submitted at the sitting of the Academy of Athens, Greece, on March 22. This paper was written by Miss Densmore at the invitation of Professor Const. Maltezos, a member of the Academy.

AT THE ANNUAL MEETING of the National Academy of Sciences, held in Washington, D.C., on April 23, 24, and 25, 1928, the following papers of interest to anthropologists were read: *Traces of Prehistoric Man in Alaska*, by Ales Hrdlicka; *The Racial Factor in Basal Metabolism: A Study of Maya Indians in Yucatan*, by Francis G. Benedict and G. D. Williams; *Recent Discoveries Relating to the Tertiary Ancestry of Man*, by Henry Fairfield Osborn; *Discovery of Extraordinary Turquoise Mosaic in the Buried Temple at Chichen Itza, Yucatan*, by E. H. Morris; *A Study of the Brains of Three Scholars*, by H. H. Donaldson; and *The So-Called "Depth of Sleep,"* by H. M. Johnson.

DR. A. L. KROEBER of the University of California has been accorded the honor of membership in the National Academy of Sciences.